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TRADE NAME	MODEL	SET AND FOLDER NO.
CBS-Columbia	18C18, 18L18, 18M08, 18M18, 18T18 (Ch. 817-6), 22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A) Tel. Rec.	214-2
Coronado	35RA2-43-5101A	214-3
Crosley	EU-17COL, COLB, COLBU, COLU, TOLa, TOLB, TOLBU, TOLU, EU-21CDL, CDLB, CDLBU, CDLU, COLBd, COLBU, COLd, COLBe, COLe, COLU, COS, COSB, COSBU, COSU, TOL, TOLB, TOLBU, TOLU (Ch. 385, 386, 387, 393, 394, 396) Tel. Rec., Prod. Chg. Bul. 73	214-1
Hudson	236486, 238060 (SH758)	214-4
Lincoln	FAG-18805-A (3SH-756)	214-5
Masco	52, 52C, 52CR, 52L, 52LR, 52R Recorder	214-6
Mercury	FAF-18805-A (SM-757)	214-5
Motorola	21C1, B, BD, BDY, BY, D, DY, Y, 21F2, B, BY, F, FB, FY, Y, 21F3, B, BD, BDY, BY, D, DY, Y, 21K4, A, AY, B, BD, BDY, BY, C, CB, CBY, CW, CWY, CY, D, DY, W, WD, WDY, WY, Y, 21K5, B, BD, BDY, BY, D, DY, Y, 21K6, D, DY, Y, 21K7, D, DY, Y, 21K9, Y, 21K10, B, BY, Y, 21K11, B, BY, Y, 21T4ACY, 21T7, B, BY, Y (Ch. TS-292A, AY, B, BY, C, CY, VTS-292A, AY, B, BY, C, CY WTS-292A, AY, B, BY, C, CY) Tel. Rec. Prod. Chg. Bul. 73	214-1
Olympic	21C65, 21C68, 21C72, 21C73, 21D60, 21D64, 21K61, 21K62, 21K63B, 21T58, 21T69, 21T70, 21T74 (Ch. TN) Tel. Rec.	214-7
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Westinghouse	H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2) Tel. Rec.	214-10
Zenith	K-1812E-3, K-1812R-3 (Ch. 19K22-3), K-2229E-3, K-2229R-3 (Ch. 19K24-3) Tel. Rec.	214-11

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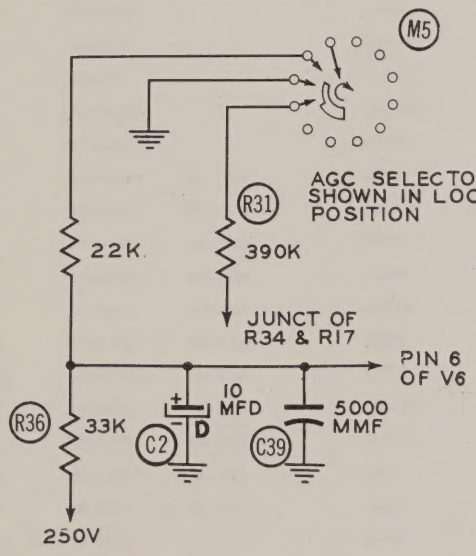
SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 193

Ch. 385, 386, 387	Crosley Models EU-17COL, EU-17COLB, EU-17TOLa, EU-17TOLB (Ch. 385, EU-21COLBd, EU-21COLd (Ch. 386), EU-21COLBe, EU-21COLe (Ch. 387), EU-21TOL and EU-12TOLB (Ch. 386) are covered in Photofact Folder 3, Set 193. Four new Models using Ch. 387 have added to this group. They are EU-21CDL, EU-21CDLB, EU-21COS, EU-21COSB.
Ch. 393, 394, 396	Three new chassis have been added which are electrically identical to chassis 385, 386 and 387, except, a built-in UHF Converter (Part #154848) is included. The new chassis are 393, 394 and 395. For service data on the UHF Converter, see Part #154927, Photofact Folder 5, Set 211. The new Model numbers in which these chassis are used are: EU-17CO LBU, EU-17COLU, EU-17TOLBU, EU-17TOLU (Ch. 396), EU-21CDLBU, EU-21CDLU, EU-21COLBd (Ch. 386), EU-21COLBU (Ch. 394), EU-21COLd (Ch. 386), EU-21COLBe, EU-21COLe (Ch. 387), EU-21COLU (Ch. 394), EU-21COS, EU-21COSB (Ch. 387), EU-21COSBU, EU-21COSU (Ch. 394), EU-21TOL, EU-21TOLB (Ch. 386), EU-21TOLBU, EU-21TOLU (Ch. 393)
Ch. 385, Code B Ch. 386, Code E Ch. 387, Code D Ch. 393, 394, 396, Code B	In Ch. 385, 393, 394, 396 (Coded B), Ch. 386, (Coded E), and Ch. 387 (Coded D), the following changes were made to improve vertical sync stability. R32 was omitted. R36 was changed to a 33KΩ, 2 watt resistor. A 22KΩ, 1 watt resistor was added between the junction of C3, R36 and terminal 2 of the AGC switch. R31 was removed and reconnected in series with the lead from terminal 4 of the AGC switch to the junction of R34 and R17. A partial schematic of the revised circuit is given below: 
Ch. 386, Code J Ch. 387, Code H Ch. 393, 394, Code F	In Ch. 386, Coded J, Ch. 387, Coded H, and Ch. 393 and 394, Coded F, a 470KΩ resistor was added in series with the center arm of the focus control, R6. This change was made to reduce arcing in the focus control. In addition to the above in some chassis, the horizontal hold control may oe changed to 170KΩ. The part number for the control is 155511.

CROSLEY MODELS EU-17COL, EU-17COLB (Ch. 385), EU-17CO LBU, EU-17COLU (Ch. 396), EU-17TOLa, EU-17TOLB (Ch. 385), EU-17TOLBU, EU-17TOLU (Ch. 396), EU-21CDL EU-21CDLB (Ch. 387), EU-21CDLBU, EU-21CDLU (Ch. 394), EU-21COLBd (Ch. 386), EU-21COLBU (Ch. 394), EU-21COLd (Ch. 386), EU-21COLBe, EU-21COLe (Ch. 387), EU-21COLU (Ch. 394), EU-21COS, EU-21COSB (Ch. 387), EU-21COSBU, EU-21COSU (Ch. 394), EU-21TOL, EU-21TOLB (Ch. 386), EU-21TOLBU, EU-21TOLU (Ch. 393)

PRODUCTION CHANGES
BULLETIN 73

PRODUCTION CHANGES
BULLETIN 73

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Ch. TS-292A-00 thru TS-292B-03

Earlier production of Motorola Models 21C1, B, 21F2, B, 21F3, B, 21K4, A, B, W, 21K5, B, 21K6 and 21K7 (Ch. TS-292A-00 thru TS-292B-03) were covered in Photofact Folder 13, Set 191 and Production Change Bulletin 63, Set 197-1.

Production changes on Motorola television receivers are noted by a series of letter and number suffixes added to the basic chassis number. Original production of Ch. TS-292 thus was coded Ch. TS-292A-00. With the first production change this was changed to Ch. TS-292A-01, etc. In general, when minor changes are made the number coding is advanced one, and when a major change is made the letter code is advanced. Each change code, also, includes all previous changes, unless otherwise stated. For example, Ch. TS-292A-03 would contain all changes coded "A-01" and "A-02" in addition to the changes made in code "A-03".

Ch. VTS-292, WTS-292

The prefix "V" to the chassis number indicates a mechanical change in the method of mounting the picture tube. The TT-45 tuner (part #1U721334) and a different volume and contrast control (part #18K722191) are, also, used in Chassis with the prefix "V". This tuner and control differ only in shaft length from the ones used in the basic TS-292 chassis.

The prefix "W" to the chassis number indicates a mechanical change in the picture tube front support brackets.

Chassis using the prefix "V" or "W" use the same production change code as the basic TS-292 chassis.

Ch. TS-292Y, VTS-292Y, WTS-292Y

Chassis with the suffix "Y" contain a factory installed UHF converter. Ch. TS-292Y and WTS-292Y use the TT-52M UHF tuning unit and Ch. VTS-292 Y uses the TT-60M UHF tuning unit. These units are electrically identical to Model TK-17M which is covered in Photofact Folder 5, Set 193.

Several new Models have been added using Ch. TS-292, Y, VTS-292, Y and WTS-292, Y. A list of the new Models numbers, with the chassis used in each is given below.

MODEL NO.	TV CHASSIS	RADIO CHASSIS
21C1BD	WTS-292	
21C1BDY	WTS-292Y	
21C1BY	TS-292Y	
21C1D	WTS-292	
21C1DY	WTS-292Y	
21C1Y	TS-292Y	
21F2BY	WTS-292Y	HS-316A
21F2F	WTS-292	HS-316A
21F2FB	WTS-292	HS-316A
21F2FY	WTS-292Y	HS-316A
21F2Y	TS-292Y	HS-316A
21F3BD	WTS-292	HS-316A
21F3BDY	WTS-292Y	HS-316A
21F3BY	TS-292Y	HS-316A
21F3D	WTS-292	HS-316A
21F3DY	WTS-292Y	HS-316A
21F3Y	TS-292Y	HS-316A
21K4AY	TS-292Y	
21K4BD	WTS-292	
21K4BDY	WTS-292Y	
21K4BY	TS-292Y	
21K4C	WTS-292	
21K4CB	WTS-292	
21K4CBY	WTS-292Y	
21K4CW	WTS-292	
21K4CWY	WTS-292Y	
21K4CY	WTS-292Y	
21K4D	WTS-292	
21K4DY	WTS-292Y	
21K4WD	WTS-292	
21K4WDY	WTS-292Y	
21K4WY	TS-292Y	
21K4Y	TS-292Y	
21K5BD	WTS-292	
21K5BDY	WTS-292Y	
21K5BY	TS-292Y	
21K5D	WTS-292	
21K5DY	WTS-292Y	
21K5Y	TS-292Y	
21K6D	WTS-292	
21K6DY	WTS-292Y	
21K6Y	TS-292Y	
21K7D	WTS-292	
21K7DY	WTS-292Y	
21K7Y	TS-292Y	
21K9	WTS-292	
21K9Y	WTS-292Y	
21K10	VTS-292	
21K10B	VTS-292	
21K10BY	VTS-292Y	
21K10Y	VTS-292Y	
21K11	VTS-292	
21K11B	VTS-292	
21K11BY	VTS-292Y	
21K11Y	VTS-292Y	
21T4ACY	TS-292Y	
21T7	VTS-292	
21T7B	VTS-292	
21T7BY	VTS-292 Y	
21T7Y	VTS-292Y	

(Cont. on reverse side)

In later production of Ch. TS-292, VTS-292 and WTS-292, the following changes were made.

Ch. TS-292B-04, VTS-292B-04, WTS-292B-04

FUSE WIRE ADDED

A fusing wire ($1\frac{1}{2}$" piece of #26 wire) was added between the filament winding of the transformer T1 and point Y.

TO ELIMINATE BARKHAUSEN OSCILLATION

A 470Ω, 1 watt, resistor was added in the screen circuit of the horizontal output tube, V15. This resistor is R81 in Set 191-13, which is shown as not being used in all chassis.

Ch. TS-292B-05, VTS-292B-05, WTS-292B-05

TO REDUCE HORIZONTAL FOLDOVER

The peaking resistor, R79, was changed from 4700Ω to 6800Ω.

Ch. TS-292B-06, VTS-292B-06, WTS-292B-06

TO INCREASE THE AMPLITUDE OF THE BLANKING PULSE AT THE GRID OF THE PICTURE TUBE

R64 was changed from 3300Ω to 1800Ω.

R65 was changed from 1800Ω to 3300Ω.

NOTE: This change did not occur in some chassis until code "C-01".

Ch. TS-292C-00, VTS-292C-00, WTS-292C-00

TO IMPROVE VIDEO RESPONSE

The compensating coil, L24, and the 4.5MC trap, L25, were interchanged.

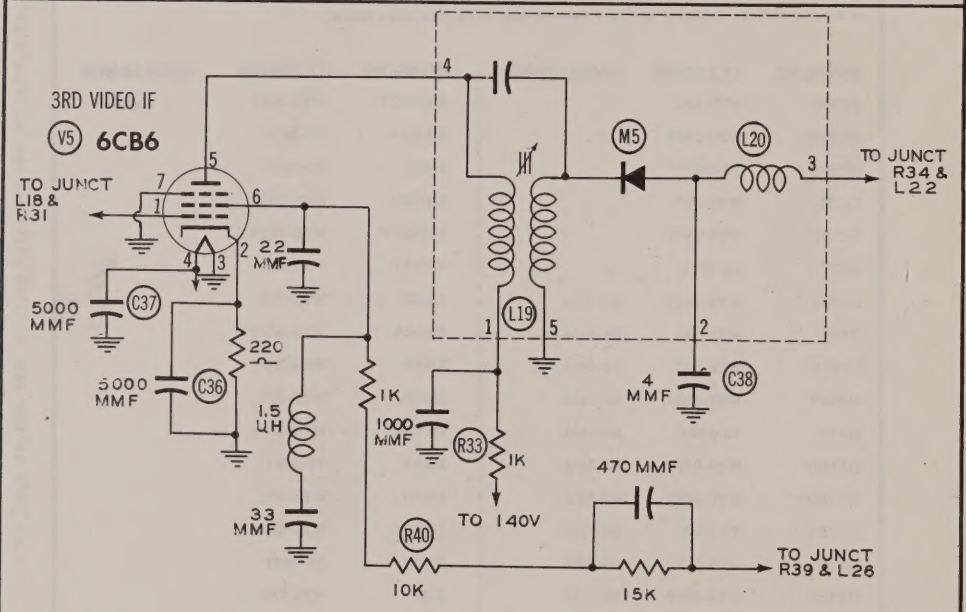
TO IMPROVE VERTICAL NOISE IMMUNITY

C68, sync clipper grid capacitor, was omitted.

A 15KΩ resistor and a 470MMF capacitor, connected in parallel, were added between R40 and the junction of R39 and L26, in the plate circuit of the video amplifier, V6.

The plate and screen circuits of the 3rd. video IF amplifier were revised. A partial schematic showing the new circuit is given below.

NOTE: Chassis coded "C-00" do not contain the changes included in code "B-06" above.



Ch. TS-292C-01, VTS-292C-01, WTS-292C-01

Chassis coded "C-01" include the changes listed for both code "B-06" and "C-00" above.

Ch. TS-292C-02, VTS-292C-02, WTS-292C-02

TO IMPROVE INTERLACE

R65, sync clipper plate resistor, was changed from 680KΩ to 1Meg.

Ch. TS-292C-03, VTS-292C-03, WTS-292C-03

TO PREVENT HIGH VOLTAGE FLASH-OVER IN PICTURE TUBE

A 5000MMF, 2000 volt capacitor was added from the picture tube focus anode (pin 6) to chassis. (This capacitor was removed when the 100KΩ resistor was added in chassis coded "B-03" covered in Production Change Bulletin 63. Both the resistor and capacitor are used in chassis coded "C-03 ")

TO PREVENT HIGH VOLTAGE FLASH-OVER IN THE VERTICAL OUTPUT TUBE

C76, vertical output cathode by-pass capacitor, was changed to a 5000MMF, 2000 volt capacitor.

PHOTOFACT* Folder

CBS-COLUMBIA MODELS 18C18, 18L18, 18M08, 18M18, 18T18 (Ch. 817-6), 22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A)

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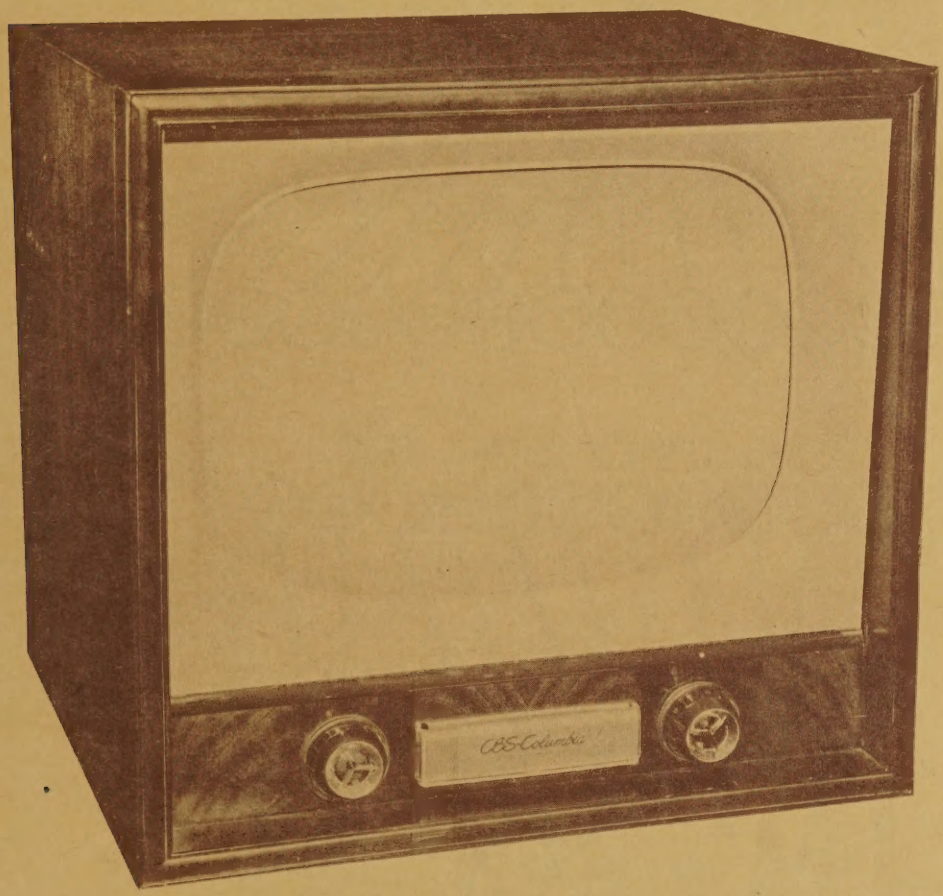
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 22T18

CBS-COLUMBIA MODELS 18C18, 18L18, 18M08, 18M18, 18T18 (Ch. 817-6), 22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A)

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DATE 9-53 SET 214 FOLDER 2

PHOTOFACT* Folder

*TRADE MARK

CBS-COLUMBIA MODELS 18C18, 18L18, 18M08, 18M18, 18T18 (Ch. 817-6), 22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A)

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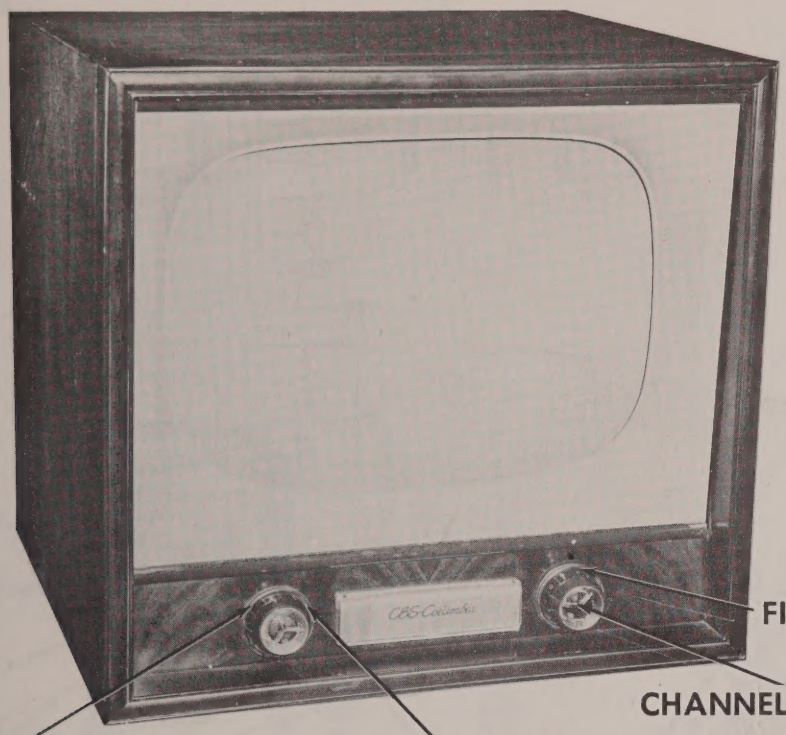

CBS-COLUMBIA
MODELS 18C18, 18L18, 18M08, 18M18, 18T18 (Ch. 817-6), 22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A)

CBS-COLUMBIA MODEL 22T18

TRADE NAME	CBS-Columbia Models 18C18, 18L18, 18M08, 18M18, 18T18 (Ch.817-6), 22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A)
MANUFACTURER	CBS-Columbia, 170- 53rd.St., Brooklyn 32, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.94 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

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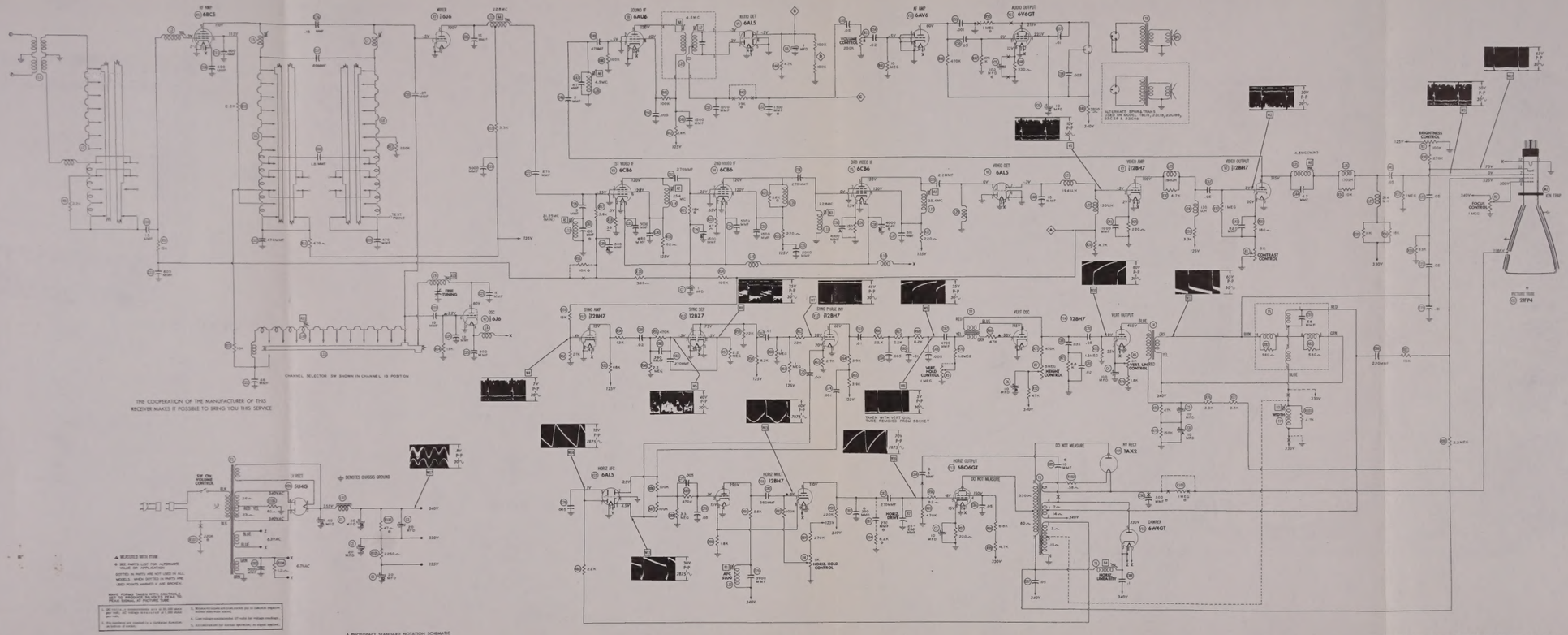

CBS-COLUMBIA MODELS 18C18, 18L18, 18M08, 18M18, 18T18 (Ch. 817-6),
22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A)

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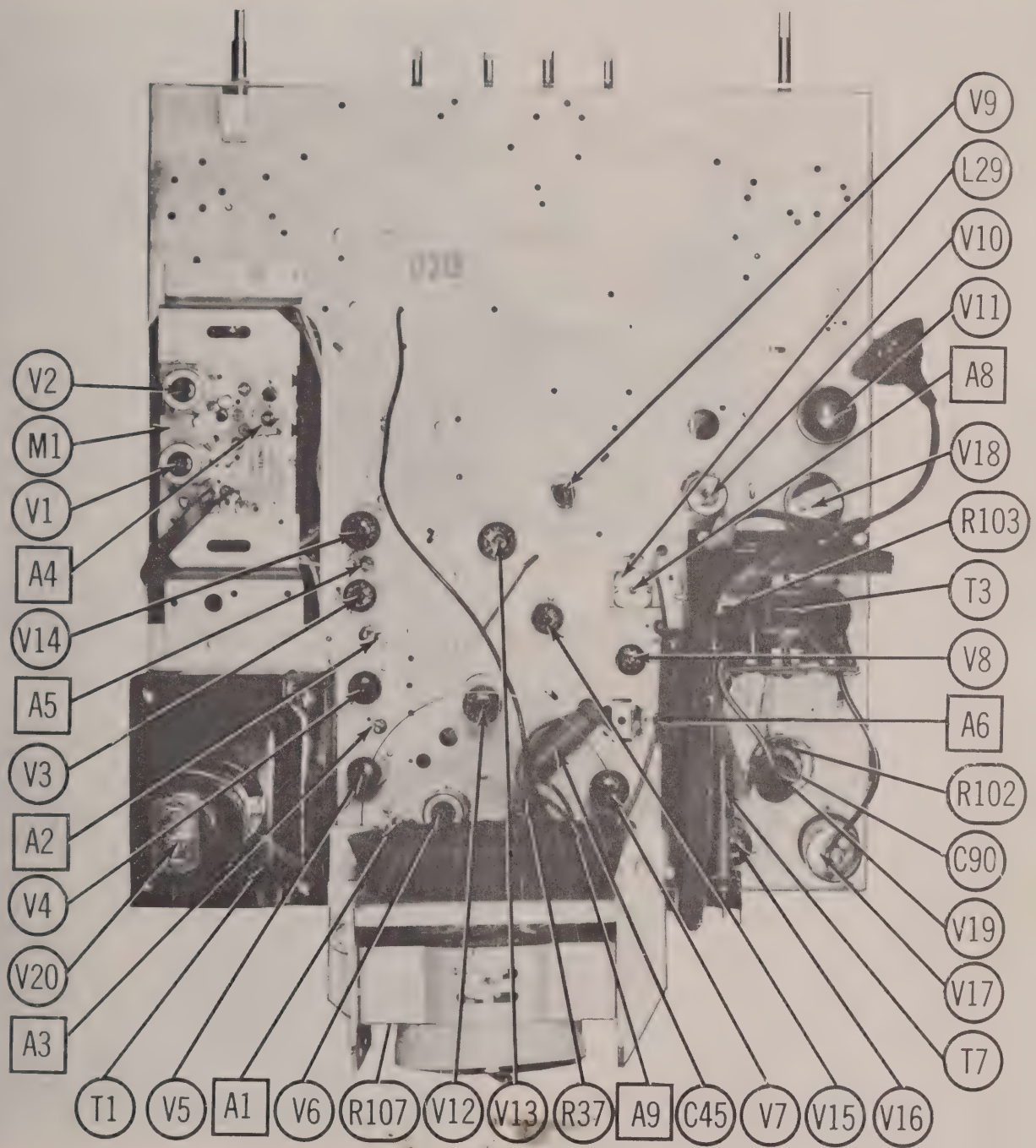
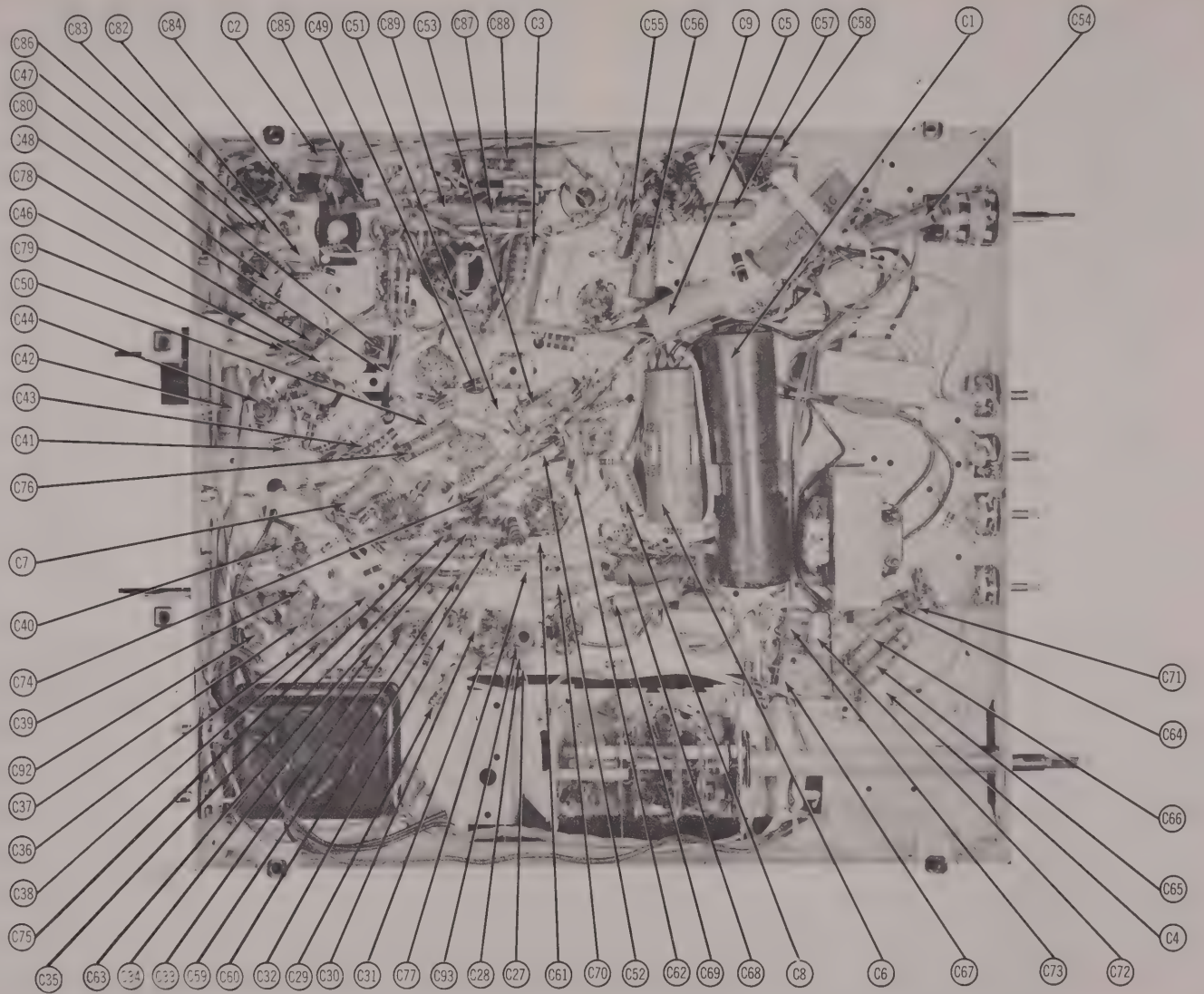
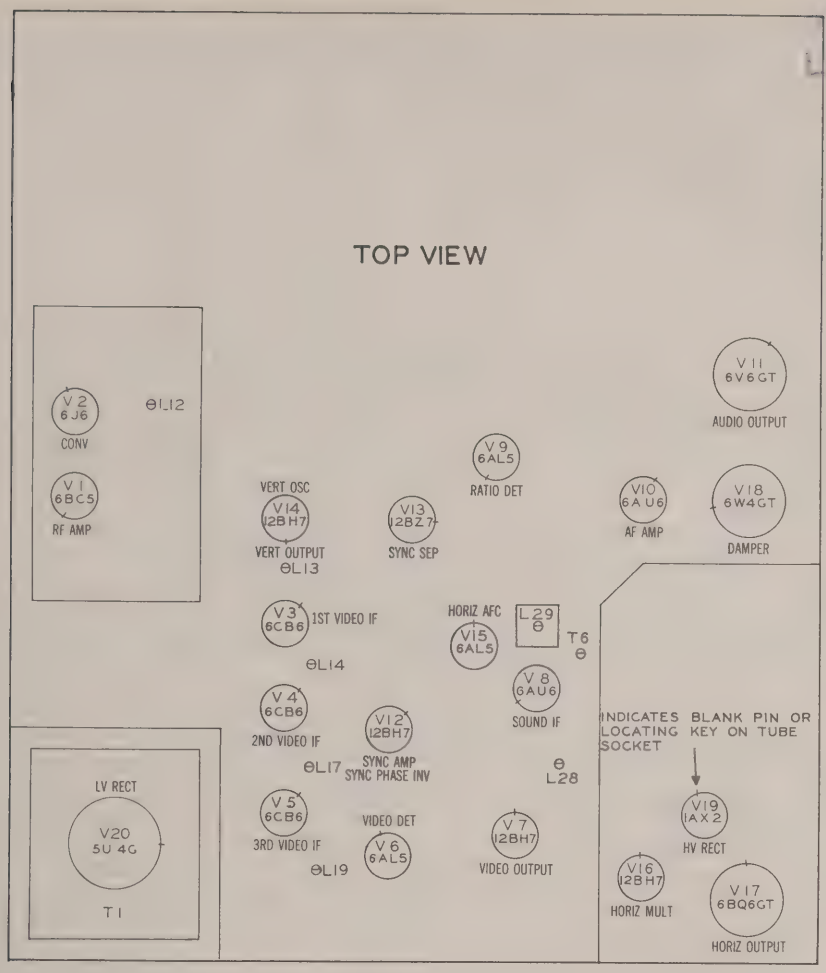


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V21
Has pic, no sound - V8, V9, V10, V11

SYNC FAILURE
No vert. sync - V12, V14
No horiz. sync - V12, V15, V16
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21
No vertical deflection - V14
Poor vert. linearity or foldover - V14
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, V20
Vert. off freq. - V12, V14
Horiz. off freq. - V12, V15, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube, V16.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.4MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1, A2	Adjust for maximum deflection. Attenuate generator output for approximately 3 Volts DC at VTVM.
2.	"	"	22.8MC	"	"	A3, A4	"
3.	"	"	21.25MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.25MC 25.75MC	Any	Vert. amp thru 10KΩ to point (A) Low side of chassis.		Check for response similar to Fig. 1 If necessary retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistor is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A6, A7	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point (C) Common to point (D)	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C8. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A8	Reconnect capacitor C8. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 2 (grid) of picture tube. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A9	Adjust for MINIMUM deflection.

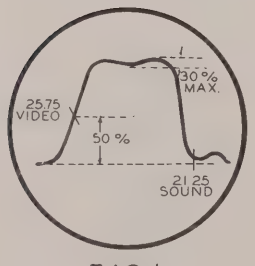


FIG. 1

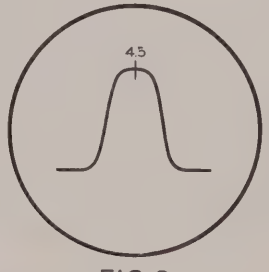


FIG. 2

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

PROPERTY OF

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp thru 10KΩ to point (A) Low side to chassis.	A10	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
9.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for sound marker placement as in Fig. 4. If necessary retouch A10 for best compromise on high band channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
10.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A11	Adjust to place sound marker in trap notch as in Fig. 4. Video marker sound be at 50%.
11.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for sound marker placement as in Fig. 4. If necessary, retouch A11 for best compromise on low band channels.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

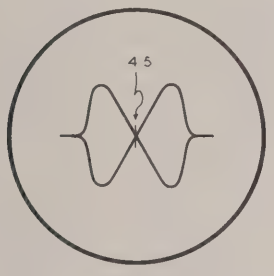


FIG. 3

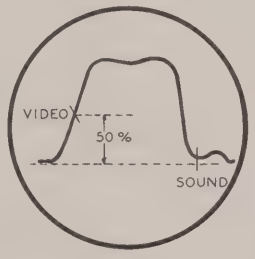
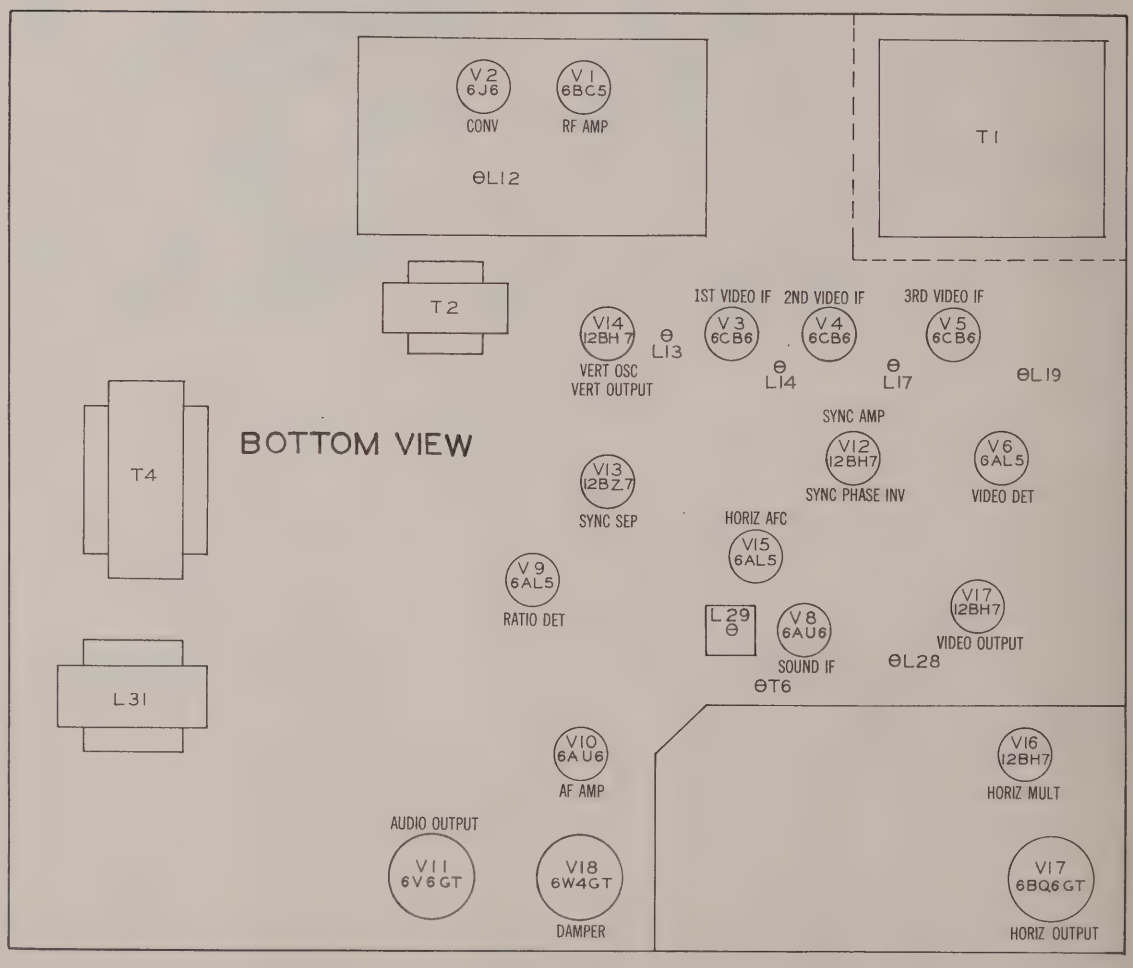


FIG. 4

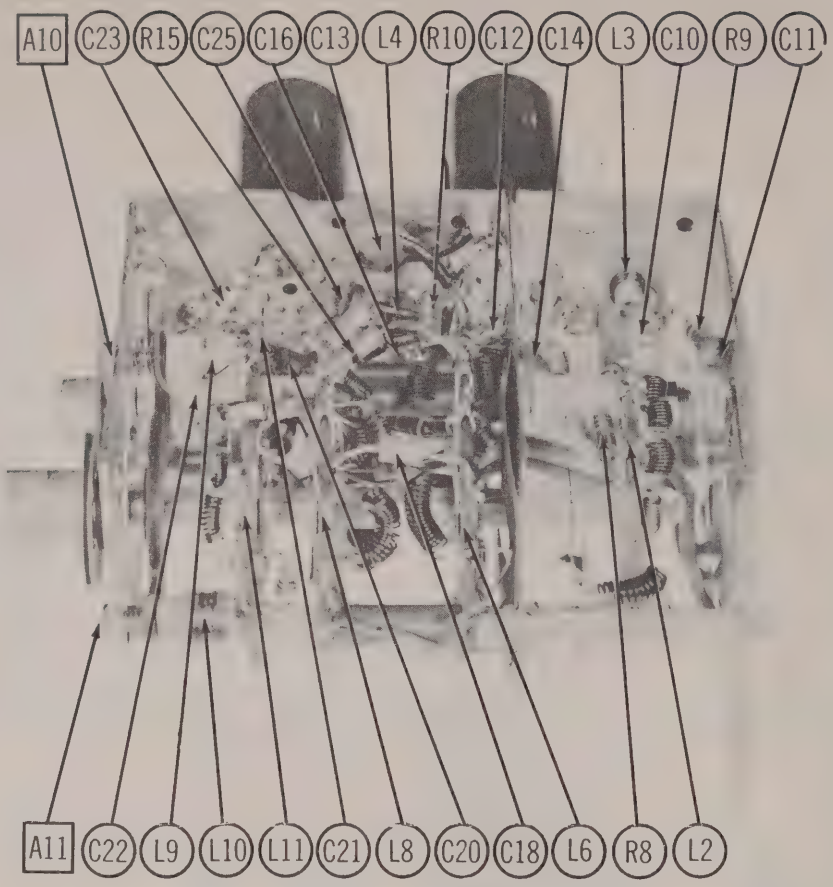
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	115KΩ	0Ω	0Ω	.1Ω	†2.8KΩ	†5KΩ	0Ω		
V 2	6J6	†12KΩ	†5.6KΩ	0Ω	.1Ω	220KΩ	15KΩ	0Ω		
V 3	6CB6	105KΩ	33Ω	.1Ω	0Ω	†2.4KΩ	†2.4KΩ	0Ω		
V 4	6CB6	120KΩ	47Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 5	6CB6	.2Ω	150Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 6	6AL5	2.8Ω	0Ω	0Ω	.1Ω	0Ω	0Ω	4.7KΩ		
V 7	12BH7	†5.6KΩ	4.7KΩ	220Ω	0Ω	0Ω	†6.8KΩ	1 Meg	2.6KΩ	.1Ω
V 8	6AU6	100KΩ	0Ω	0Ω	.1Ω	†4.1KΩ	†100KΩ	0Ω		
V 9	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	47KΩ		
V 10	6AV6	10Meg	0Ω	.1Ω	0Ω	0Ω	0Ω	†475KΩ		
V 11	6V6GT	0Ω	0Ω	†3.9KΩ	†3.3KΩ	470KΩ	† 1 Meg	.1Ω	330Ω	
V 12	12BH7	†10KΩ	†520KΩ	2.7KΩ	0Ω	0Ω	†70KΩ	11KΩ	0Ω	.1Ω
V 13	12BZ7	†8.3KΩ	2.2Meg	0Ω	0Ω	0Ω	†8.3KΩ	2.6Meg	0Ω	.1Ω
V 14	12BH7	■8.3KΩ	1.5Meg	3.5KΩ	0Ω	0Ω	1.8Meg	2.4Meg	0Ω	.1Ω
V 15	6AL5	3.4Meg	3.4Meg	0Ω	.1Ω	22KΩ	0Ω	22KΩ		
V 16	12BH7	†5.7KΩ	3.8Meg	1.8KΩ	0Ω	0Ω	†220KΩ	100KΩ	1.8KΩ	0Ω
V 17	6BQ6GT	470KΩ	0Ω	INF	†11KΩ	470KΩ	■190KΩ	.1Ω	220Ω	Top Cap ■60Ω
V 18	6W4GT	†62.5Ω	INF	140KΩ	INF	†77Ω	INF	■.1Ω	■0Ω	
V 19	1AX2	PINS 1 - 9 HAVE INF RESISTANCE								Top Cap ■390Ω
V 20	5U4G	INF	18KΩ	INF	76Ω	INF	73Ω	INF	18KΩ	
V 21	21FP4	0Ω	1 Meg	Pin 6 ■190KΩ	Pin 10 ■2.2Meg	Pin 11 350KΩ	Pin 12 .1Ω			

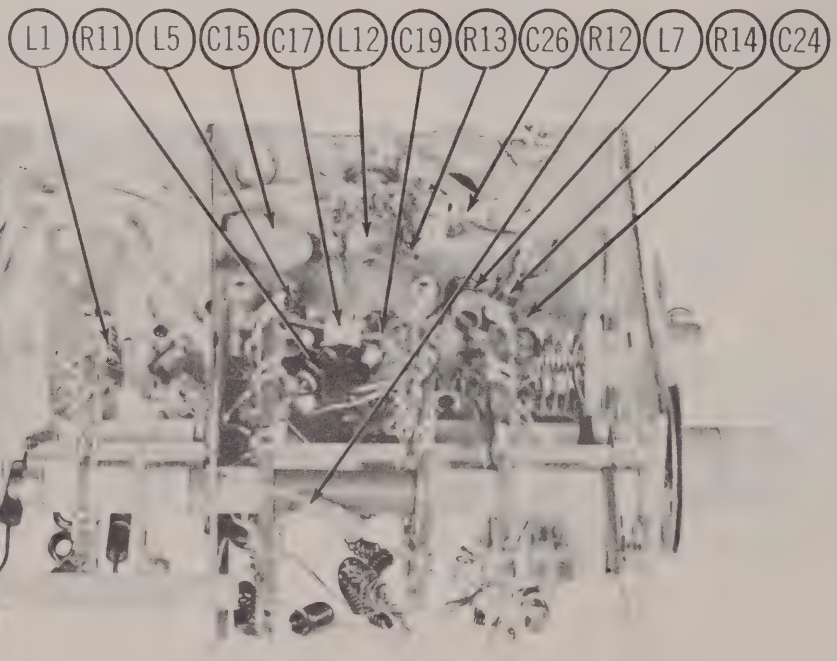
■ MEASURED FROM PIN 3 OF V 18.
† MEASURED FROM PIN 2 OF V20.



TUBE PLACEMENT CHART

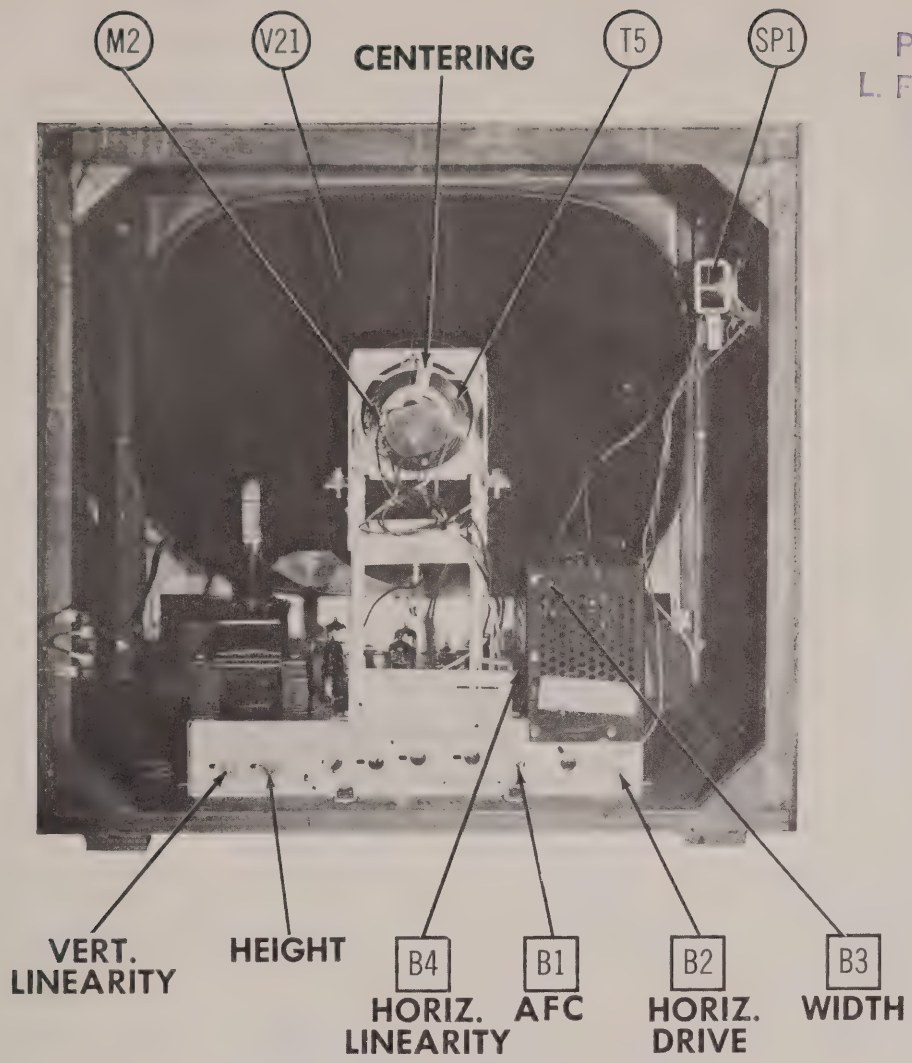


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PROPERTY OF
L. F. BLANKENSHIP



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at mid-position and adjust the AFC slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression of the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow the procedure outlined under **LOSS OF HIGH VOLTAGE.**

INSUFFICIENT SWEEP

Check by substitution V16, V17, V18 and V20. Check amplitude of waveform W16.

If Insufficient	If Sufficient
Check all components of horizontal oscillator and coupling network between V16 and V17. Check drive control and R95.	Check all components of horizontal output tube, including T3, T5A, T6 and T7. Check damper circuit components. Check B+ for proper supply voltage.

DRIVE LINES

Substitute V16, V17 and V18. Check associated components, especially the drive control and R95.

PIE CRUST EFFECT (Fig. 1)

Check C78 for open. Check other associated components.

COMPRESSED AT LEFT SIDE

Substitute V17 and V18. Check all components of damper circuit. Check T3, T5A and T6.

XMAS TREE EFFECT

Substitute V16 and check associated components, particularly L30 and C79.

VERTICAL

LOSS OF SWEEP

Substitute V14. Check waveform W10.

If Unsatisfactory	If Satisfactory
Check vertical oscillator components, T2 and C70.	Check all components of vertical output stage including T4 and T5B.

INSUFFICIENT SWEEP

Substitute V14. Follow procedure outlined under LOSS OF SWEEP .

SWEEP COMPRESSED FOR APPROX. 20 SECONDS THEN GRADUALLY BECOMES NORMAL

Check C69 for open.

COMPRESS AT TOP, EXPANDED AT BOTTOM, BOTTOM FOLDED FOR SHORT TIME THEN BECOMES NORMAL

Check R73 for open or greatly increased resistance.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V12, V13, V15 and V16. Check waveform W15.

If Unsatisfactory	If Satisfactory
Check waveform W13.	Check all components of V16B.

Check waveform W13

If Unsatisfactory	If Satisfactory
Check waveform W7.	Check all components of V16A, especially the AFC filter circuit in the grid circuit of V16A.

Check waveform W7.

If Unsatisfactory	If Satisfactory
Check all components of the sync amplifier and the sync separator. Check the coupling network between V13 and V12B.	Check all components of the phase inverter and the horizontal phase detector.

CRITICAL SYNC

Substitute V15 and V16. Check associated components.

PULLING PICTURE

Substitute V15 and V16. Check associated components. Check AFC filter in the grid circuit of the horizontal oscillator (C77 and C78)

VERTICAL

LOSS OF SYNC

Check by substitution V12, V13 and V14. Check waveform W8.

If Unsatisfactory	If Satisfactory
Check all components of V12 and V13. Check all components of integrating network.	Check all components of vertical oscillator expecially T2 and C70.

CRITICAL SYNC

Check by substitution V12, V13 and V14. Follow procedure outlined under LOSS OF SYNC .

VERTICAL OSCILLATOR RUNNING AT A MULTIPLE FREQUENCY (Fig. 2)

Check vertical waveshaping capacitor C68 for open.

Fig. 1. PIE CRUST EFFECT
SEE HORIZ. SWEEP

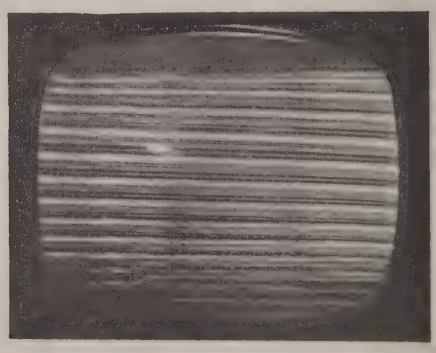


Fig. 2. VERT. OSC. RUNNING AT A MULTIPLE FREQ.
SEE VERT. SYNC

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
DENVER COLORADO

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CBS-C [illegible] PART No.	STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	9JA	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector	6AL5	6AL5	6BT	
V7	Video Output	12BH7	12BH7	9A	
V8	Sound IF Amp.	6AU6	6AU6	7HA	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6AV6	6AV6	7BT	
V11	Audio Output	6V6GT	6V6GT	8S	
V12	Sync Amplifier-Sync Phase Inv.	12BH7	12BH7	9A	
V13	Sync Separator	12BZ7	12BZ7	9A	
V14	Vert. Oscillator-Vert. Output	12BH7	12BH7	9A	
V15	Horiz. AFC	6AL5	6AL5	6BT	
V16	Horiz. Mult.	12BH7	12BH7	9A	
V17	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	5AX3	5AX3	5T	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: CBS-Columbia PART No	SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V21A	21EP4A	21EP4A	12C	① Circuit changes necessary
B	17HP4	21EP4 ①	12C	
C	20HP4A	17HP4	12C	
		20HP4A	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	CBS-Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	450	PA20144	PRS450/40-		BBRD4445		2N537	TVA-2740	Red
B	40	450		40				TCD75	TVA-2730	Blue
C	20	450		PRS450/20-		BBRD2345				Green
D	20	450		20						Orange
C2	10	25	PA20137	PRS25/10		BR102A		TC22	TVA-1204	
C3	25	12	PA20147	PRS25/25		BR252A		TC26	TVA-1205	
C4	100	25	PA20130	PRS25/100		BRH251A		TC2501	TVA-1207	
C5	10	250	PA20145	PRS350/10		BR1235A		TC52	TVA-1504	
C6A	10	450	PA20135	PRS450/10-10		BRD1045B		43T27	TVA-2722	Blue
B	10	450		PRS450/10		BR1045A			TVA-1705	Yellow
C	10	450								Red
C7	1	50	PA20138	PRS150/4		BBRI-50T		TC31	TVA-1300	
C8	1	50	PA20138	PRS150/4		BBRI-50T		TC31	TVA-1300	
C9	10	12		PRS12/100		BRH121A		TC2501	TVA-1130	Note 1
C10	15			SI25	D6-150		GP1K-150	UC-5415	5GA-Q15	
C11	[illegible]			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C12	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C13	[illegible]			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C14	800			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C15	5000			BPD-005	MD-501	TM5D5	81-005	DC-525	5HK-D5	
C16	.68									
C17	.68			TCZ-.68			NP0K-R68			
C18	1.8						NP0K-1R8			
C19	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C20	.27									
C21	[illegible]			SU10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C22	.68				TCZ-.68		NP0K-R68			
C23	4						N330K-040			
C24	[illegible]			SU2NP0	TCZ-12		NP0K-120			
C25	[illegible]			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C26	15			SI25	D6-150		GP1K-150	UC-5415	5GA-Q15	
C27	270	500	PE190-133	SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555	5GA-V5	
C28A	1500		PA19147	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C29	680	500	PE556-234							
C31	5000		PA19109	BPD-005	MD-502	TM5D5	81-005	DC-525	5HK-D5	
C32	270	500	PE190-133							
C33	5000		PA19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C34	5000		PA19109	BPD-005	MD-502	TM5D5	81-005	DC-525	5HK-D5	
C35	[illegible]		PA19109	BPD-005	MD-502	TM5D5	81-005	DC-525	5HK-D5	
C36	270	500	PE190-133							
C37	510	500	PE190-140	SI510			GP2K-501			
C38A	[illegible]			BPD-2X004	D5-402	TM5DD4	822-004	DCD-524	5HK-2D4	Note 2
B	1000				D6-403					Note 2
C39	22	500	PE19-107							
C40	10		PE555-101	SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C41	1000		PE555-136	SI1000	D6-102	TM5D1	GP3L-102	UC-5311	5HK-D1	
C42	.05	600	PE194-160	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C43	820		PP19201							
C44	47	500		1489-00005		SR5Q5		MCB225	MS-45	
C45	.05	600	PE197-180	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C46	5		PE555-100	SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555	5GA-V5	
C47	47	500		1489-00005		SR5Q5		MCB225	MS-45	
C48	47		PE555-113-3	SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCCB-Q47	
C49	1500		PA19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C50	.005	600	PE194-151	PS88-005	DE-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C51	1000		PE556-236	SI1000	D6-102	TM5D1	GP3L-102	UC-531	5HK-D1	
C52	1500			SI1500	D6-152	TM5D15	GP3L-152	UC-5315	5HK-D15	Note 1
C53	.05	600	PE194-160	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C54	.02	600	PE194-158	PS88-02	DF-203	PTE6S2		PT612	6TM-S2	
C55	.001	600	PE194-145	PS88-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C56	.05	600	PE194-160	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C57	.01	600	PE194-155	PS88-01	D6-103	PTE6S1	GP2-333-103	PT61	6TM-S1	
C58	.005	600	PE194-151	PS88-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	VOLT	CBS-Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59	.02	600	PE194-158	PS88-02	DF-403	PTE6S5		PT615	6TM-S5	
C60	390	500	PE190-137	1460-0004		SR5T4		MCB243	MS-34	
C61	270	500	PE190-133	1460-0003		5R5T3		MCB241	MS-33	
C62	.01	600	PE194-155	PS88-01	D6-103	PTE6S1	GP2-333-103	PT61	6TM-S1	
C63	.01	600	PE194-155	PS88-01	D6-103	PTE6S1	GP2-333-103	PT61	6TM-S1	
C64	.005	600	PE194-151	PS88-005	D6-502	PTE6S5	GP2-333-502	PT625	6TM-D5	
C65	.01	600	PE194-155	PS88-01	D6-103	PTE6S1	GP2-333-103	PT61	6TM-S1	
C66	.005	600	PE194-151	PS88-005	D6-502	PTE6S5	GP2-333-502	PT625	6TM-D5	
C67	4700	500	PE192-163	1464-005		1DR5D5		MCB485	MS-25	
C68	.035	600	PE194-159							
C69	.02	600	PE194-158	PS88-02	DF-203	PTE6S2		PT612	6TM-S2	
C70	.05	600	PE194-160	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C71	.01	600	PE194-155	PS88-01	D6-103	PTE6S1	GP2-333-103	PT61	6TM-S1	
C72	.05	600	PE194-160	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C73	.05	600	PE194-160	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C74	.001	600	PE194-145	PS88-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C75	.001	600	PE194-145	PS88-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C76	.005	600	PE197-151	PS88-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C77	.005	600	PE197-151	PS88-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C78	.05	600	PE194-160	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C79	3900	500	PE190-139	1464-004		1DR5D4		MCB483	MS-24	
C80	390	500	PE190-137	1469-0004		5R5T4		MCB243	MS-34	
C81	270	500	PE190-133	1469-0003		5R5T3		MCB241	MS-33	Note 3
C82	390	500	PE190-137	1469-0004		5R5T4		MCB243	MS-34	Note 4
C83	270	500	PE190-133	1469-0003		5R5T3		MCB241	MS-33	
C84	5	2500	PP19145					MCP555		Notes 5, 6
C85	10	2500	PP19148	HVD30-00001				MCP410	30GA-QI	Note 6
C86	.05	600	PE197-180	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C87	.05	600	PE197-180	PS88-05	DF-503	PTE6S5		PT615	6TM-S5	
C88	.1	600	PE197-182	PS88-1	DF-104	PTE6P1		PT601	6TM-P1	
C89	220	1000	PP19180	HVD15-00022				MCK222	10GA-T22	
C90	500	20000	PA1998-3	HV20C	TV3-502	MM-C20T5	413-501		20DK-T5	Note 6
C91	56	1500		PS88-1		DF-104	PTE6P1			
C92	5000		PA19109	BPD-005	MD-502	TM5D5	81-005	DC-525	5HK-D5	
C93	100	500		1469-0001		5R5T1		MCB235	MS-31	Note 7

Note 1. Not used in all Models.
Note 2. Some Models use 5000MMF in this application.
Note 3. Used in Ch. 817-6 only.
Note 4. Ch. 817-6 uses 120MMF in this application (part #PE190-125)
Note 5. Ch. 820-6 uses 10MMF in this application (part #PP19148)
Note6. Used in Ch.820-6, 820-6A, 821-6 only.
Note 7. Some Models use 82MMF in this application.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	CBS-Columbia PART No.	IRC PART NO.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	5000Ω		A24142	QJ-365*	RTV-261	SBB-744-S	UF53R	Contrast-Panel
B	250KΩ						UR254A †	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	1 Meg		A24112	QJI-137	AG-61-S	AB-69	SU-54	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	100KΩ		A24110	QJI-128	AG-60-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	5000Ω		A24142	QJI- 114	AG-19-S	AB-19	SU-14	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	1 Meg		A24112	QJI-137	AG-61-S	AB-69	SU 54	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	3000Ω		A24116	WK-3000	A43-3000	SU-8		Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4		Not Req.	Attach to R6A
R7A	5 Meg		A24111	QJI-141	AG-85-S	AB-87	SU-87	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req	Attach to R7A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B17-14 & P1 196 (Panel)
B13-130 & R1-126 (Rear) & SWITCH 76-1.
† UNIVERSAL REPLACEMENT-(MALLORY EXACT DUPLICATE PART NO. UE505S).

RESISTORS

ITEM No.	RATING: OHMS	WATT	CBS-Columbia PART No.	IRC PART No.	NOTES
R8	2200Ω			BTS-2200	
R9	15KΩ				
R10	2200Ω			BTS-2200	
R11	470Ω			BTS-470	
R12	220KΩ			BTS-220K	
R13	3300Ω			BTS-3300	
R14	15KΩ				
R15	10KΩ			BTS-10K	
R16	10KΩ		PE31-1173	BTS-10K	Note 2
R17	3900Ω		PE31-1163	BTS-3900	
R18	33Ω		PE31-1113	BTS-33	Note 1
R19	82Ω		PE31-1123	BTS-82	
R20	330Ω		PE31-1137	BTS-330	
R21	18KΩ				Note 6
R22	47Ω		PE31-1117	BTS-47	
R23	220Ω		PE31-1133	BTS-220	
R24	100KΩ		PE31-1197	BTS-100K	
R25	560Ω		PE31-1167		Note 7
R26	150Ω		PE31-1129	BTS-150	
R27	220Ω		PE31-1133	BTS-220	
R28	4700Ω		PE31-1185	BTS-4700	
R29	220Ω		PE31-1133	BTS-220	
R30	4700Ω		PE31-1185	BTS-4700	
R31	3300Ω		PE32-1181	BTA-3300	
R32	1 Meg		PE31-1221	BTS-1 Meg	
R33	180Ω		PE31-1131	BTS-180	
R34	10KΩ		PE31-1173	BTS-10K	
R35	11KΩ-5%	2	PE33-74	BTB-11K-5%	
R36	18KΩ	2	PE33-1179	BTB-18K	
R37	1 Meg		PE31-1221	BTS-1 Meg	
R38	270KΩ		PE31-1207	BTS-270K	
R39	33KΩ		PE31-1185	BTS-33K	
R40	100KΩ		PE31-1197		

ITEM No.	RATING: OHMS	WATT	CBS-Columbia PART No.	IRC PART No.	NOTES
R41	100KΩ		PE31-1197		
R42	180Ω		PE31-1155	BTS-1800	
R43	39KΩ			BTS-39K	Note 1
R44	47KΩ			BTS-47K	
R45	10Meg		PE31-1245	BTS-10Meg	
R46	470KΩ		PE31-1213	BTS-470K	
R47	470KΩ		PE31-1213	BTS-470K	
R48	330Ω	1	PE232-1137	BTA-330	
R49	3250Ω	7	PC2134-4	1 3/4A-3500	
R50	1 Meg		PE31-1221	BTS-1 Meg	
R51	15KΩ		PE31-1177	BTS-15K	
R52	27KΩ		PE31-1183	BTS-27K	
R53	68KΩ		PE31-1193	BTS-68K	
R54	12KΩ		PE31-1175	BTS-12K	
R55	470KΩ		PE31-1213	BTS-470K	
R56	2.2Meg		PE31-1229	BTS-2.2Meg	
R57	2.2Meg		PE31-1229	BTS-2.2Meg	
R58	8200Ω		PE31-1171	BTS-8200	
R59	22KΩ		PE32-1181	BTA-22K	
R60	1 Meg		PE31-1221	BTS-1 Meg	
R61	1 Meg		PE31-1221	BTS-1 Meg	
R62	22KΩ		PE31-1181	BTS-22K	
R63	2700Ω		PE31-1159	BTS-2700	
R64	3900Ω		PE31-1163	BTS-3900	
R65	3900Ω		PE31-1163	BTS-3900	
R66	22KΩ		PE31-1181	BTS-22K	
R67	22KΩ		PE31-1181	BTS-22K	
R68	8200Ω		PE31-1171	BTS-8200	
R69	47KΩ		PE31-1189	BTS-47K	
R70	1.8Meg ± 5%	1	PE232-127	BTA-1.8Meg-5%	
R71	470KΩ		PE31-1213	BTS-470K	
R72	47KΩ		PE31-1189	BTS-47K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	WATT	CBS-Columbia PART No.	IRC PART No.	NOTES
R73	6800Ω		PE231-1169	BTS-6800	
R74	1800Ω		PE231-1155	BTS-1800	
R75	1.5Meg		PE231-1225	BTS-1.5Meg	
R76	3300Ω	2	PE233-1161	BTB-3300	
R77	3300Ω	2	PE233-1161	BTB-3300	
R78	47KΩ	1	PE232-1189	BTA-47K	
R79	150KΩ	1	PE232-1201	BTA-150K	
R80	2.2Meg	1		BTA-2.2Meg	
R81	15KΩ		PE232-1177	BTA-15K	
R82	560Ω			BTS-560	
R83	560Ω			BTS-560	
R84	270KΩ		PE231-1207	BTS-270K	
R85	22KΩ	1	PE232-1181	BTA-22K	
R86	100KΩ		PE231-1197	BTS-100K	
R87	100KΩ		PE231-1197	BTS-100K	
R88	3.3Meg		PE231-1233	BTS-3.3Meg	
R89	470KΩ		PE231-1213	BTS-470K	
R90	180Ω		PE231-1155	BTS-1800	

ITEM No.	RATING: OHMS	WATT	CBS-Columbia PART No.	IRC PART No	NOTES
R91	5600Ω		PE231-1187	BTS-5600	
R92	100KΩ		PE231-1197	BTS-100K	
R93	220KΩ		PE231-1205	BTS-220K	
R94	6200Ω		PE231-1171	BTS-6200	Note 4
R95	470KΩ		PE231-1213	BTS-470K	
R96	82Ω	3	PE231-1123		
R97	220Ω	3	PE233-1133	BW-2-220	
R98	6800Ω	3	PE233-1169	BTB-6800	
R99	4700Ω	3	PE233-1165	BTB-4700	
R100	47Ω	1	PE231-1117		Note 5
R101	4700Ω	3	PE233-1165	BTB-4700	
R102	.56Ω	1	PE23163		
R103	1 Meg	2	PE233-2321		Note 3
R104	1.8Ω	2	PE23151		
R105	2250Ω	15	PC2134-16	2D-2250	
R106	80Ω	10	PC2134-2		
R107	220KΩ	1		BTA-230K	Note 1

Note 1. Not used in all models.
Note 2. Omitted when tuner No. PC5413J9 is used.
Note 3. Not used in chassis No. 817-6.
Note 4. Not used in chassis 820-6 & 821-6.
Note 5. Chassis No. 817-6 & 820-6 use a 22Ω resistor in this application.
Note 6. Some models may use a 15KΩ resistor in this application.
Note 7. Some models may use a 8200Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No	RATING: PRI	SEC. 1	SEC. 2	SEC. 3	CBS-Columbia PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	680VCT	5VAC	6.3VAC	A19103					
	& 1.8A	.220ADC	@ 3A	@ 2.2A						
				SEC. 4						
				6.3VAC						
				@ 1.2A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI	SEC	CBS-Columbia PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No	RCA TYPE No.	NOTES
T2	160Ω	920Ω	A10108-1	A-8125	A-3003	TBO-5	A-97X	208T2 ㉔	Vert. Osc. Trans.
			A10108 ①						
T3	390Ω tap	21Ω tap ⑥	A10136B ④	A-8130 ④	HVO-X7 ④	TFB-19 ⑦	D-14 ④ ⑤		Horiz. Output Trans.
	& 60Ω	14Ω	A10137 ②	⑤ ⑥			⑥ ⑦		
		SEC. 2	A10136 ②						
		3.15Ω tap @ .15".							
		SEC. 3 0Ω							
T4	1700Ω	6Ω	A10152-1A	A-8141 ⑯	A-3039 ⑯	TSO-12 ⑯	A-104X ⑯	236T1 ⑯	Vert. Output Trans.
			A10152-1 ⑱						
T5A	12Ω		A28330 ⑪	DY-8A ⑭	MDF-70 ⑭	TY-3 ⑭	Y-12 ⑭	306D1 ⑭	Horiz. Deflection Coils
			A28329 ⑮						
B	44Ω		A28328 ⑱						Vert. Deflection Coils
			A28292 ⑭						
T6	33Ω			WC-5 ⑯	MWC-1 ⑯	TWL-1	WC-11 ⑯	20IR3	Horiz. Linearity Coil
				⑰	⑰				
T7	2.3Ω		A28318-1 ⑱		MWC-2 ⑰	TW-5		20GR1	Width Coil

① Alternate Vert. Osc. Trans.
② Alternate Horiz. Output Trans.
③ Use with width coil WC-5.
④ Drill new mounting holes.
⑤ Short out original width coil and damping resistor.
⑥ See instruction sheet packed with unit for terminal connections.
⑦ Wire as in original circuit.
⑧ Use with width coil WC-11.
⑨ Alternate Vert. Output Trans.
⑩ Connect blue lead of transformer to plate. Connect green lead of transformer and boosted B+ to brown lead of yoke. Remove green lead of yoke from its present terminal and connect to red lead of transformer.
⑪ Includes yoke cover and positioning device A28331
⑫ Used on Ch. 820-6.
⑬ Used on Ch. 817-6.
⑭ Use original yoke cover and positioning device
⑮ Use original deflection coil network.
⑯ Enlarge mounting hole.
⑰ Do not use secondary.
⑱ Connect to coded blue and red terminals.
⑲ A-28270-1 used on Ch. 817-6 and 820-6.
⑳ Mount on top of chassis.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	RATING: IMPEDANCE PRI	IMPEDANCE SEC	DC RES PRI	DC RES SEC	CBS-Columbia PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T8	4 95KΩ	3.2Ω	395Ω	.76Ω	Part of Speaker	A-3877 ①	A-2930 ①	RO-301 ①	S-3X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C IMP	CBS-Columbia PART No	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	5	PM	3.2Ω	PC5866	ST-105 Mod. P5-X	5A1	① Used in models 18C18, 22C18, 22C18B, 22C28 and 22C08.
B	8	PM	3.2Ω	PC58124 ①	ST-106 Mod. P8-U	8A31	

CBS-COLUMBIA MODELS 18C18, 18L18, 18M08, 18M18, 18T18 (Ch. 817-6), 22C08, 22C18, B, 22C28, 22L18, 22M08, 22M18, 22T18 (Ch. 821-6, A)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CBS-Columbia PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Trans.	0Ω CT	0Ω					Low channel secondary-0Ω
L2	Ant. Coils	0Ω						
L3	Ant. Coil	0Ω						Channel 13
L4	Fil. Choke	0Ω						
L5	RF Coil	0Ω						Channel 13
L6	RF Coils	0Ω						
L7	Mixer Grid Coil	0Ω						Channel 13
L8	Mixer Grid Coils	0Ω						
L9	Osc. Plate Coil	0Ω CT						Channel 13
L10	Osc. Coil	0Ω						Channel 6
L11	Osc. Coils	0Ω						
L12	1st. Video IF	.5Ω						Tapped @ .3Ω
L13	Accompanying Sound Trap	0Ω		A28314	20-1021	TV-112 †	6171 †	
L14	2nd. Video IF	.2Ω		A3392	17-1003	TV-102 †	6188 †	
L15	Fil. Choke	.27Ω		A28276	19-3001	TV-189	6175	.82 Microhenry (IRC part #CL-1)
L16	RF Choke	2.8Ω		A28253	19-3036	TV-180	6176	35 Microhenries
L17	3rd. Video IF	.2Ω		A3392	17-1004	TV-103 †	6189 †	
L18	Fil. Choke	.27Ω		A28276	19-3001	TV-189	6175	.82 Microhenry (IRC part #CL-1)
L19	4th. Video IF	.2Ω		A3392	17-1003	TV-102 †	6188 †	
L20	RF Choke	2.8Ω		A28253	19-3036	TV-180	6176	35 Microhenries
L21	Series Peaking Coil	6.5Ω		A28255-2	19-3180	TV-184	6154	194 Microhenries
L22	Shunt Peaking Coil	7Ω		A28255-1	19-3125	TV-181	6153	130 Microhenries
L23	Series Peaking Coil	6.5Ω		A28255-2	19-3180	TV-184	6154	194 Microhenries
L24	Shunt Peaking Coil	7Ω		A28255-1	19-3125	TV-181	6153	130 Microhenries
L25	4.5MC Trap	1.8Ω		A28286	20-1004	TV-151	1470	
L26	Series Peaking Coil	5.3Ω		A28255-1	19-3125	TV-181	6153	130 Microhenries
L27	Shunt Peaking Coil	10Ω		A28255-4	19-3300		6155	314 Microhenries
L28	Sound IF	1.8Ω		A28286	17-3400	TV-151	1469	
L29	Ratio Det.	5.5Ω	1.9ΩCT	A1201 *	17-3497	TV-115	6205	Tertiary winding-.8Ω
L30	Horiz. Osc.	58Ω		A28263	19-1576	TV-163	6210	

* Alternate part number A1202
† Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	CBS-Columbia PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L31	.220ADC	62.5Ω	1.74 Hy.	A-1406	C-2325 ①	C-2991 ①	TR-1733 ①	C-21X ①

① Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	CBS-Columbia PART No.	NOTES
M1	RF Tuner		
M2	Ion Trap	A3206	
B2	Trimmer Cap.	PA1772	Horiz. Drive, 25-280MMF
	Cabinet	PE60181-3	Model 18M08
	Cabinet	PE60170-1	Model 18C18
	Cabinet	PE60172-1	Model 18L18
	Cabinet	PE60181-1	Model 18M18
	Cabinet	PE60182	Model 18T18
	Cabinet	PE60193	Model 22C08
	Cabinet	PE60178-3	Model 22M08
	Cabinet	PE60164-1	Model 22C18
	Cabinet	PE60164-2	Model 22C18B
	Cabinet	PE60190	Model 22L18
	Cabinet	PE60178-1	Model 22M18
	Cabinet	PE60183	Model 22T18
	Cabinet	PE60184-1	Model 22C28
	Back Cover	PC62329	Models 18M08, 18M18
	Back Cover	PC62429	Model 18C18
	Back Cover	PC62354	Model 18L18
	Back Cover	PC62474	Model 18T18
	Back Cover	PC62454-3	Model 22C08
	Back Cover	PC62465	Model 22M08, 22M18
	Back Cover	PC62430	Models 22C18, 22C18B, 22T18, 22C28
	Back Cover	PC62472	Model 22L18
	Safety Glass	PC62457-23	Models 18M08, 18M18, 22L18, 22M18
	Safety Glass	PC62457-19	Model 18C18
	Safety Glass	PC62457-1	Model 18L18
	Safety Glass	PC62457-24	Model 18T18
	Safety Glass	PC62457-25	Model 22C08
	Safety Glass	PC62457-21	Model 22M08
	Safety Glass	PC62457-13	Model 22C18, 22C18B, 22T18, 22C28
	Mask	PC62470	Models 18M08, 18M18
	Mask	PC62459	Model 18C18
	Mask	PC62464	Model 18L18
	Mask	PC62473	Model 18T18
	Mask	PC62471	Models 22C08, 22L18
	Mask	PC62455	Models 22M08, 22M18
	Mask	PC62424	Models 22C18, 22C18B, 22T18, 22C28
	Trap Door	PD4497	
	Knob	PC39242-2	Channel Selector, Models 18M08, 18L18, 22M08, 22C18B
	Knob	PC39242-1	Channel Selector, Models 18C18, 18M18, 18T18, 22C08, 22C18, 22L18, 22M18, 22T18, 22C28
	Knob	PC39240-3	Fine Tuning
	Knob	PC39241-2	Off/On Volume, Models 18M08, 18L18, 22L18, 22M08, 22C18B
	Knob	PC39241-1	Off/On Volume, Models 18C18, 18M18, 18T18, 22C08, 22C18, 22M18, 22T18, 22C28
	Knob	PC39239-3	Contrast

TROUBLE SHOOTING AIDS (CONT.)

VIDEO

LOSS OF VIDEO

Check C45 for open. Check picture tube V21.

SOUND BARS

Check adjustment of A9 (4.5MC trap). Check setting of local oscillator and alignment of video IF stages.

POOR RESOLUTION

Check alignment of tuner and video IF stages. Substitute V7 and check associated components.

POOR CONTRAST

Check waveform W1.

If Unsatisfactory	If Satisfactory
Check by substitution, the tuner and video IF tubes. Check alignment and components.	Substitute V7 and check components. Check picture tube.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, V10 and V11. Check adjustment of the ratio detector. Check C46 and C48 for open. Check T8 and the speaker.

BUZZ

Adjust ratio detector secondary for minimum buzz. Substitute V9 and check associated components.

DISTORTED

Check audio stages using audio signal generator and scope.

If Undistorted	If Distorted
Substitute V8 and V9. Check alignment and components of the ratio detector driver and the ratio detector.	Substitute tube and check component of stage where distortion occurs.

POWER

SET DEAD

Substitute V20. Check filter components. Check T1. Check interlock.

SMALL RASTER, WEAK SOUND

Follow procedure outlined under SET DEAD.

DIM PICTURE

Substitute V20. Check filter components. Check picture tube.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V16, V17, V18 and V19. Check waveform W16.

If Unsatisfactory	If Satisfactory
Check components of horizontal osc. Check coupling network between V16 and V17.	Check components of horizontal output stage. Check damper and high voltage filter components. Check particularly T3, T5A, T6 and T7.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V16, V17, V18, V19 and V20. Check B+. Follow procedure outlined under LOSS OF HIGH VOLTAGE.

BLOOMING

Follow procedure outlined under INSUFFICIENT HIGH VOLTAGE.

GENERAL

HAS RASTER BUT NO PICTURE

Substitute V2, V5, V6 and V7. Check tuner and video IF alignment.

WEAK PICTURE AND SOUND

Substitute V1, V3 and V4. Check associated components.

TOTAL LOSS OF SYNC

Substitute V12 and V13. Check associated components.

INTERMITTENT STREAKS

Check high voltage circuit for corona arcing and discharge.

The Trouble-Shooting photographs shown are made with permission of transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removing the channel selector and fine tuning knobs.

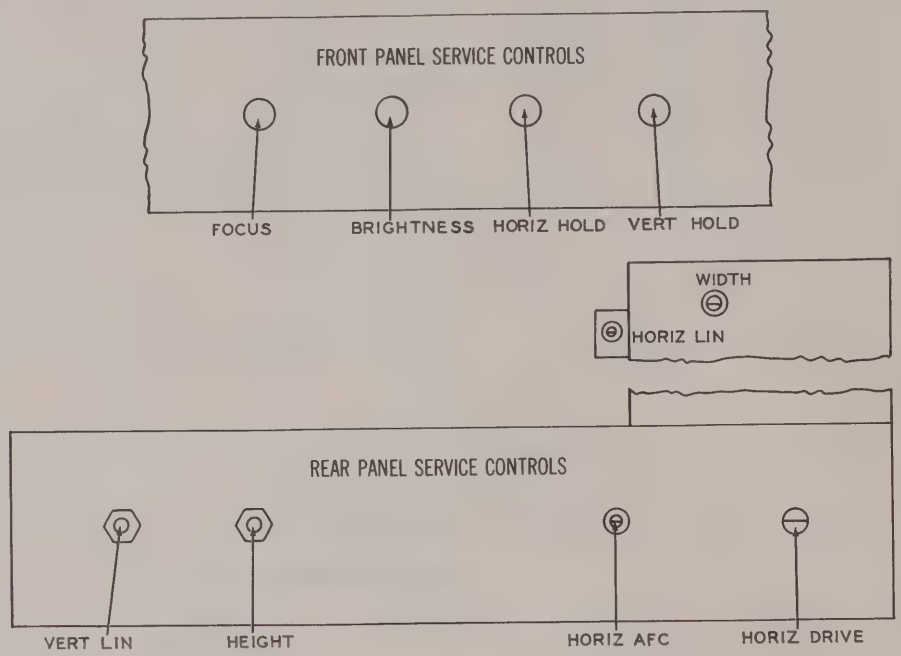
PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws holding plastic strip at top of safety glass. Remove plastic strip and safety glass by tilting foreward and lift out of slot at the bottom. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold control at the mid-position of its range and adjust the AFC slug, L30, until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

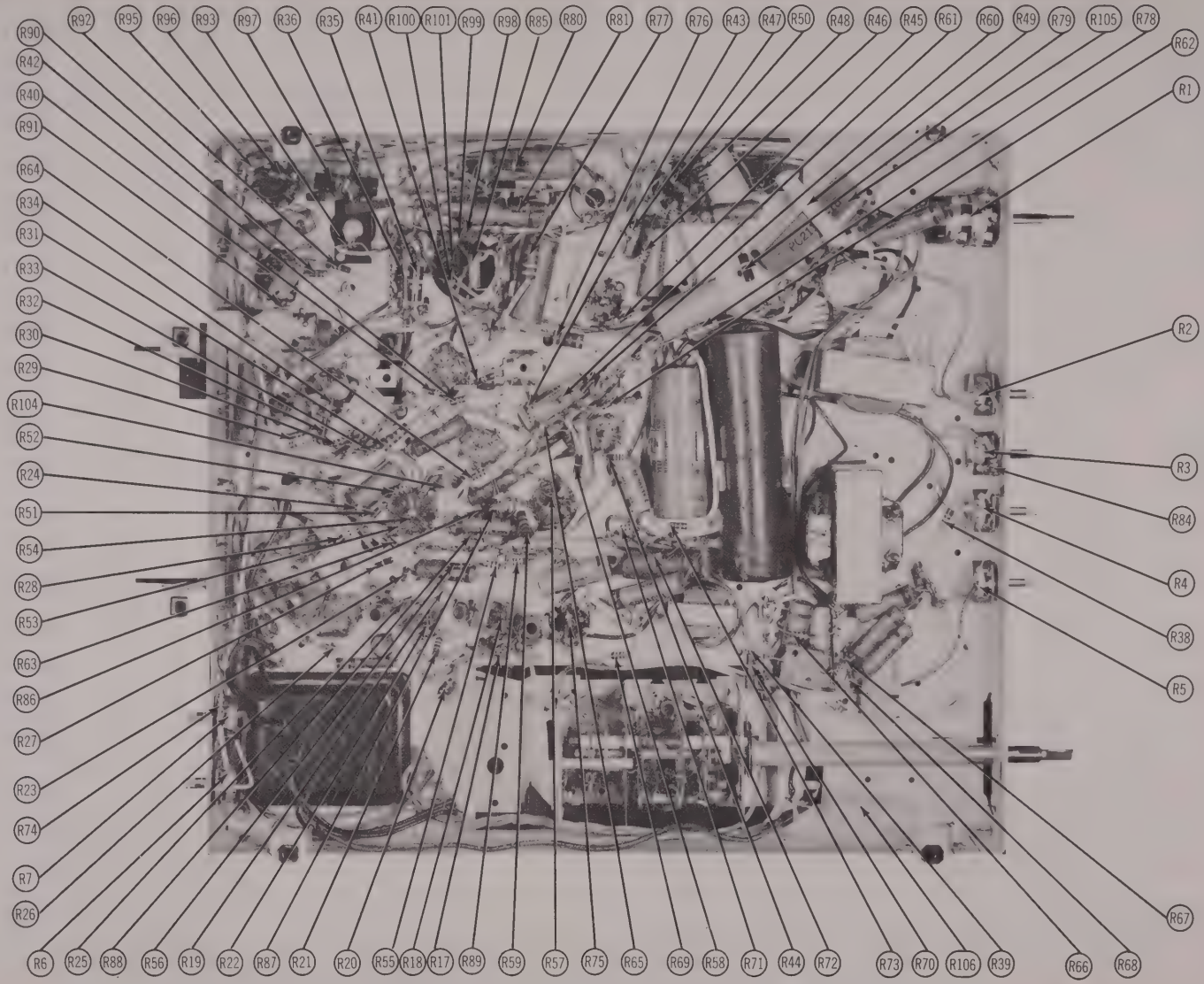
To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L29 located on top of chassis. (See tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 11 wood and 2 metal screws. Remove rear cover.
3. Disconnect built-in antenna, Remove 2 wood screws. Remove antenna bracket.
4. Disconnect speaker plug and ground lead. Remove 2 speaker nuts. Remove speaker. (Not necessary for chassis removal).
5. Remove 6 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CORONADO
MODEL 35RA2-43-5101A

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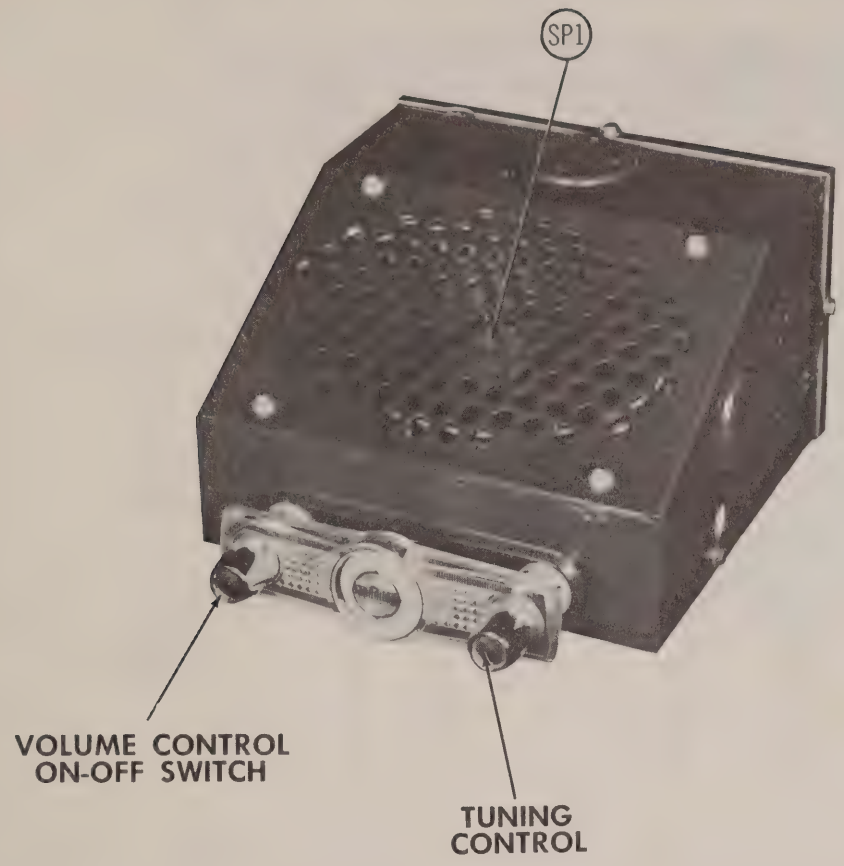
CORONADO
MODEL 35RA2-43-5101A



CORONADO
MODEL 35RA2-43-5101A

TRADE NAME	Coronado Model 35RA2-43-5101A
SUPPLIER	Gamble-Skogmo, Inc., 15 N. 8th. St., Minneapolis, Minn.
TYPE SET	Battery Operated Universal Automobile Superheterodyne Receiver
TUBES (Five)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AS5 Audio Output
POWER SUPPLY	6 Volt Storage Battery — RATING 4.7 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	High frequency end stop	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	50MMF	High side to antenna input jack. Low side to chassis.	1300KC	Tune to 1300KC signal	"	A6, A7	"

The tuner cores are adjusted and sealed at the factory. Adjustment of these cores should not be required in the field. The tuner is designed to be replaced as a unit, should that event become necessary.

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PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL 35RA2-43-5101A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6AS5	6AS5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■20	200	8C-21726	AFH3-20		CO16		FP330	TVL-3565	
B	▲20	200						TC26	TVA-1205	
C	40	25								
C2	90		8F-21949							
C3	.0047	200	8D-21819	P285-0047	D6-472	ZNW2D5	GP2-333-472	MT615	68P11	
C4	10		8G-19502	SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C5	.047	200	8D-21823	P285-047	DF-503	ZNW2S5		PT415	68P16	
C6	47		8G-12198	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C7	220	500	8F1-233							
C8A	100		♦201-15005	SI100	♦PC-50	TM5T1	♦1403-01	UC-531	♦100C1	
B	100			SI100		TM5T1		UC-531		
C9	.01	200	8D-21820	P285-01	D6-103	ZNW2S1	GP2-333-103	PT411	68P14	
C10	.0047	200	8D-21819	P285-0047	D6-472	ZNW2D5	GP2-333-472	MT 615	68P11	
C11A	250		†17A-21742		† PC-70		†1406-01		†104C4	
B										
C	.005									
C12	.01	400	8D-21828	P485-01	D6-103	ZNW 4S1	GP2-333-103	PT411	68P8	
C13	.047	400	8D-21831	P485-047	DF-503	ZNW4S5		PT415	68P10	
C14	.5	100	8D-19810	P185-5		MP2P5		VO480	68P20	
C15	.5	100	8D-19810	P185-5		MP2P5		VO480	68P20	
C16	.01	1000	8D-21836	BCD-27	DD16-103	PJ16S1		VB471	MB-S1	
C17	1000		G-20878	CN-1-001	MFT-1000				503C-D1	

♦ Items C8A, C8B, R8 are combined in one unit.
† Items C11A, C11B, C11C, R11A, R11B are combined in one unit.
When replacing items separately C11A and C11B should total 250MMF

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A-10A-21722	Q13-133X	AK-80	ABT-66	UT-427	Volume-tapped @ 125KΩ
B	Shaft		Not Req.	NQ	RS-3/16	AK-8	DS-37	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	NOTES
R2	1Meg	½	9B1-98	BTS-1Meg	
R3	220Ω	½	9B1-54	BTS-220	
R4	1Meg	½	981-98	BTS-1Meg	
R5	47KΩ	½	9B1-82	BTS-47K	
R6	2.2Meg	½	9B1-102	BTS-2.2Meg	
R7	220Ω	½	9B1-54	BTS-220	
R8	47KΩ	½	♦201-15005	BTS-47K	
R9	22KΩ	½	9B1-78	BTS-22K	

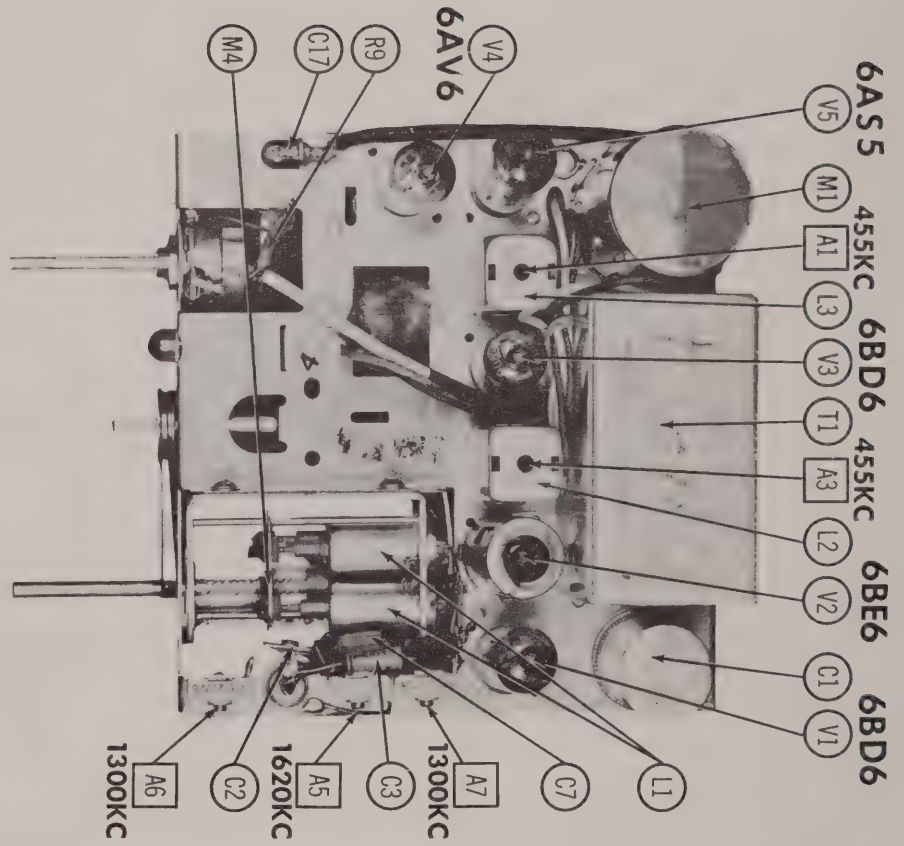
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	NOTES
R10	6.8Meg	½	9B1-108	BTS-6.8Meg	
R11A	470KΩ	½	†17A-21742	BTS-470K	
B	470KΩ	½		BTS-470K	
R12	220Ω	½	9B1-54	BTS-220	
R13	1200Ω	2	9B4-63	BTB-1200	
R14	68Ω	½	9B1-48	BTS-68	
R15	68Ω	½	9B1-48	BTS-68	
R16	3300Ω	½	9B1-68	BTS-3300	

♦ Items R8, C8A, C8B are combined in one unit.
† Items R11A, R11B, C11A, C11B, C11C are combined in one unit.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: CORONADO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3V @ 2.5A	310VCT .064ADC			B12A21729				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		CORONADO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5.3KΩ	3.6Ω	306Ω	.48Ω	B12C21731					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	VIKING PART No.	QUAM PART No.	
SP1	4 x 6"	PM	3.6Ω	B18A22125	46J6	46A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1A	Ant. Coil	12Ω						Part of tuning assy., part #13F-21922
B	RF Coil	12Ω						Part of tuning assy., part #13F-21922
C	Osc. Coil	.6Ω	5Ω					Part of tuning assy., part #13F-21922
L2	Input IF	14.5Ω	14.5Ω	13B-17731	16-6758	BC-352	12-C1	
L3	Output IF	14.5Ω	14.5Ω	13B-17731	16-6758	BC-353	12-C2	
L4	RF Filter Choke	11.5Ω		201-16379			4650	600 Microhenries
L5	Vibrator Hash Choke	0Ω		16M-19921			5221	2.65 Microhenries
L6	Fil. Choke	0Ω		16M-19921			5221	2.65 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				CORONADO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Synchronous	6.3V	115v	B21A21732	5454	742	5454	

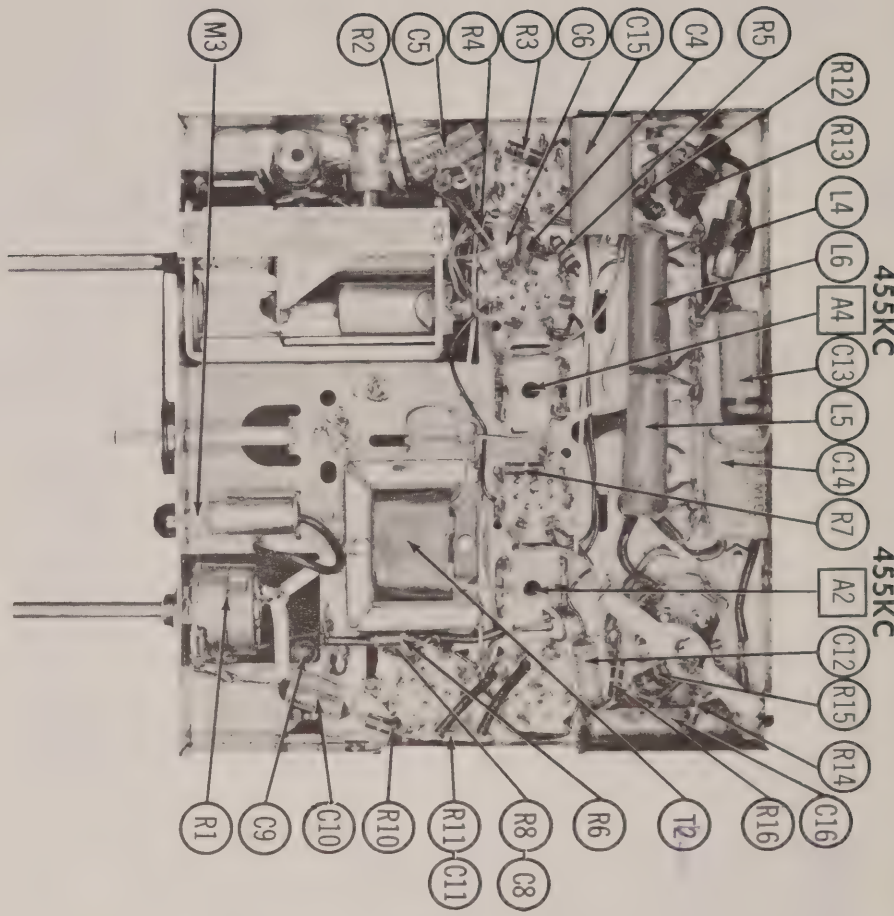
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			CORONADO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	46B-17993	14A-21919 (with cable)	307014 (SFE-14A)	155014	SFE14	HR1

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Dial Light	46A-11739	Type #44
M4	Tuning Assembly	13F-21922	Includes L1A, L1B and L1C
A5, A6			
A7	Trimmer Cap.	8E-21728	Osc., RF, and Ant. Adj. (3 used)
	Case	2B-21738-A119	
	Cover (Rear)	2B-21737-A119	
	Escutcheon	5C-22019	
	Dial Scale	5M-21796	
	Ring (Dial Scale)	43D-21719	
	Knob	4B-21985	Off/On Volume and tuning (2 used)

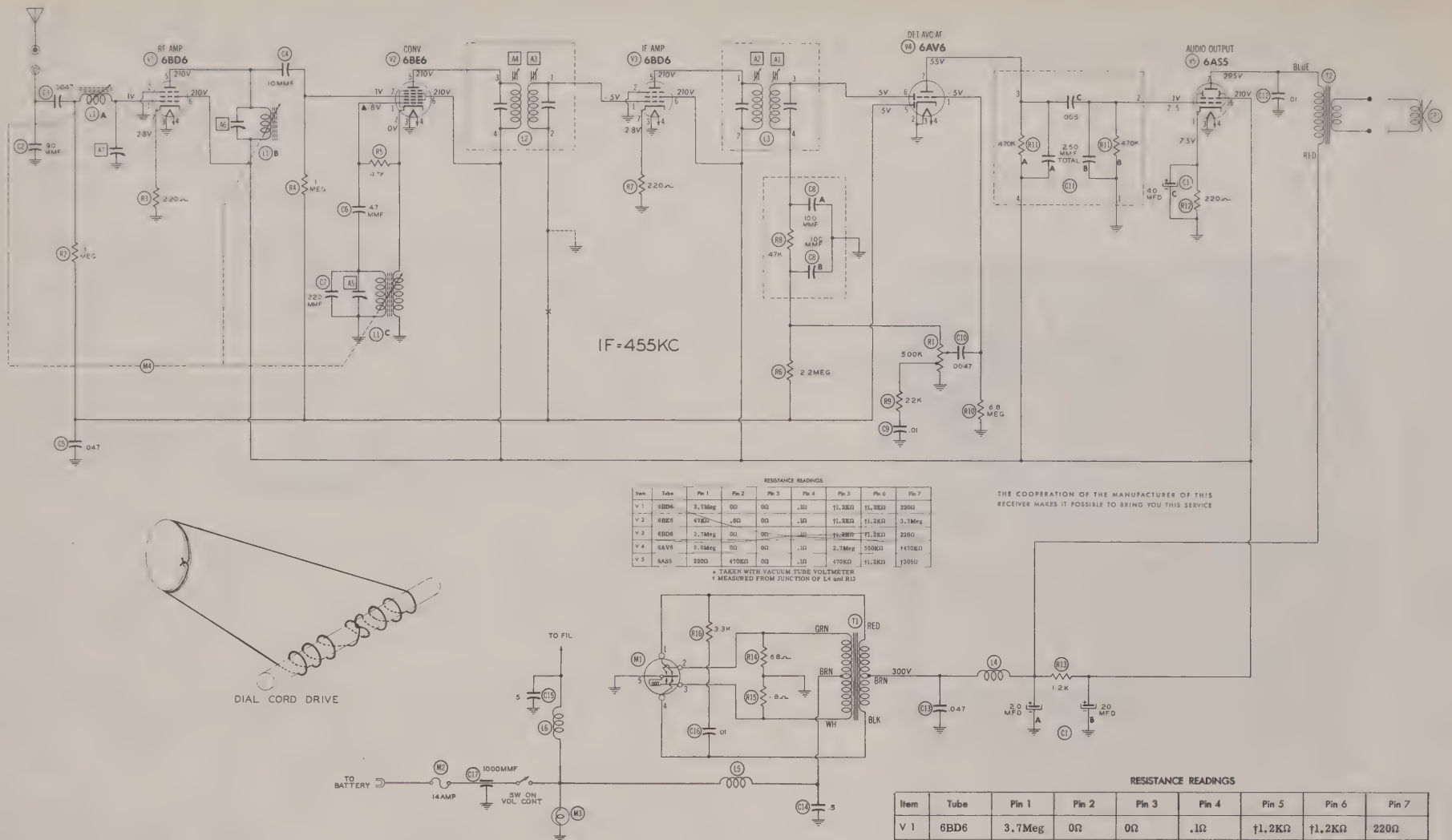
CHASSIS—BOTTOM VIEW



SET 214 FOLDER 3

CORONADO MODEL 35RA2-43-510A

CORONADO MODEL 35RA2-43-510A



THE COOPERATION OF THE MANUFACTURERS OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	3.7Meg	0Ω	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	220Ω
V 2	6BE6	47KΩ	.6Ω	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	3.7Meg
V 3	6BD6	2.7Meg	0Ω	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	220Ω
V 4	6AV6	6.8Meg	0Ω	0Ω	.1Ω	2.7Meg	550KΩ	†470KΩ
V 5	6AS5	220Ω	470KΩ	0Ω	.1Ω	470KΩ	†1.2KΩ	†305Ω

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM JUNCTION OF L4 and R13

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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214-3

1. DC Voltage measurments are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% on voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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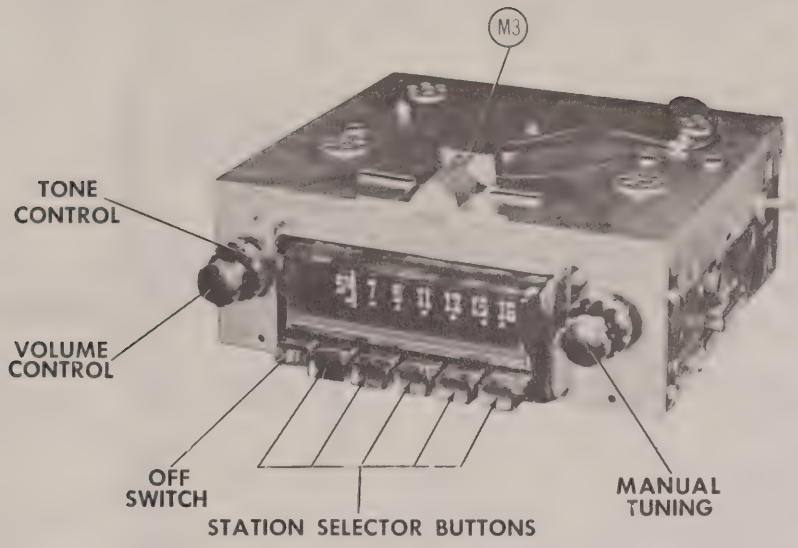
HUDSON
MODELS 236486, 238060 (SH758)



TRADE NAME	Hudson Model 236486, 238060 (Sylvania Model SH758)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & TV Div., 254 Rano St., Buffalo 7, N.Y.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Eight)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AVC-AF A mp., 6C4 Phase Inv., (2) 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 6.6 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). (accessible thru hole in case). Low side to chassis.	265KC (400∿Mod)	Quiet Point	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	See Fig.1	Thru dummy to antenna receptacle	1610KC	Tune to high frequency end stop	"	A5, A6 A7	Adjust in order given for maximum output.
3.	Check dial calibration by tuning both generator and receiver to 1000KC. Pointer should be approximately .2 inch to the left of the first "1" in "11" on the dial scale. If necessary recalibrate pointer by means of the calibration adjustment screw. Make the following adjustments only if cores or coils have been replaced or tampered with:						
4.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	Tune to high frequency end stop.	Across voice coil	A5, A6 A7	Adjust in order given for maximum output.
5.	"	"	1000KC	Tune to 1000KC point on dial. (See step 3)	"	A8, A9 A10	Adjust for maximum output in order given. Repeat steps 4 and 5 except in step 4 omit-adjustment of A5.
	With receiver aligned and installed in car, fully extend the antenna and check the antenna trimmer adjustment on a weak signal near 1000KC.						

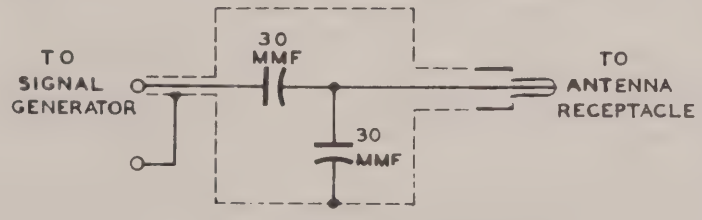


FIG. 1

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Phase Inverter	6C4	6C4	6BG	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	350								
B	▲20	350	161-3005	AFH3-107		CO80		FP345.8	TVL-3678	
C	20	25								
C2	10000		168-0002D	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C3	100	500	164-0100	1469-0001		5R5T1		MCE235	MS-31	
C4	.047	200	160-02147	P288-047	DF-503	PJ2S5		PT4147	2TM-S47	
C5	.1	400	160-0401	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C6	33		163-0033	SI33NP0	TCZ-33		NP0L-330	ZT-5433	5TCC-Q33	
C7	18	500	164-0018							
C8	230		165-0230A							
C9	.1	200	160-0201	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C10	.0056	400	160-06256	P488-006	D6-562	PTE6D6	GP2-333-562	PT626	6TM-D6	
C11	220	500	163-0220	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C12	.0047	400	160-04247	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C13	.022	200	160-02122	P488-022	DD-203	PTE4S22		PT4122	4TM-S22	
C14	.022	600	160-06122	P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C15	.022	600	160-06122	P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C16	.0082	1600	160-16282							
C17	.5	100	169-0001	VHC36		PJ2P5		VO480	68P20	
C18	1200		169-0017	CFC-1-0015	FT-1500		362-152	FC5215	503C-D15	

RESISTORS

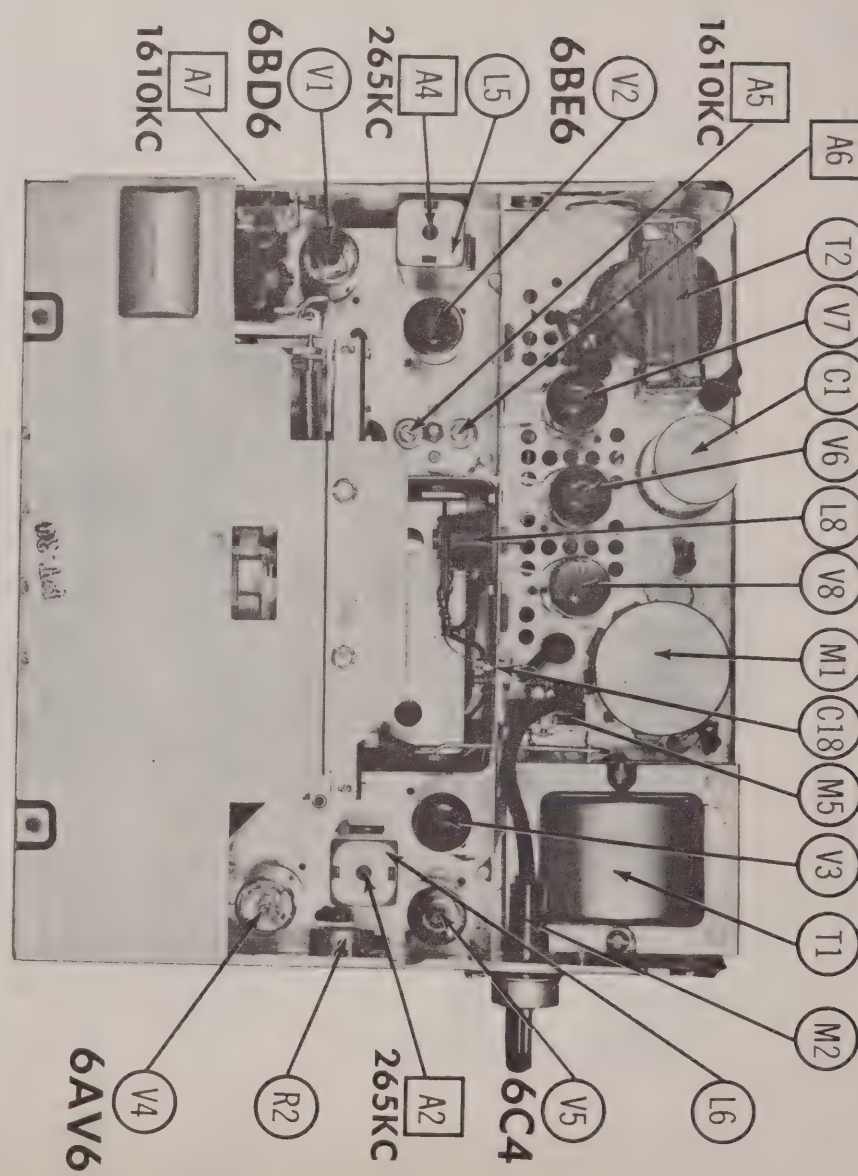
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R3	1 Meg	1/2	181-0105	BTS-1 Meg	
R4	10KΩ	1	182-0103	BTA-10K	
R5	4.7Meg	1/2	181-0475	BTS-4.7Meg	
R6	1.8Meg	1/2	181-0185	BTS-1.8Meg	
R7	47KΩ	1/2	181-0473	BTS-47K	
R8	5.6Meg	1/2	181-0565	BTS-5.6Meg	
R9	1 Meg	1/2	181-0105	BTS-1 Meg	
R10	22KΩ	1/2	181-0223	BTS-22K	
R11	12KΩ	2	183-0123	BTB-12K	
R12	47KΩ	1/2	181-0473	BTS-47K	
R13	47Ω	1/2	181-0470	BTS-47	
R14	22KΩ	1/2	181-0223	BTS-22K	
R15	15 Meg	1/2	181-0156	BTS-15Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R16	330KΩ	1/2	181-0334	BTS-330K	
R17	1500Ω	1/2	181-0152	BTS-1500	
R18	2700Ω	1/2	181-0272	BTS-2700	
R19	56KΩ	1/2	181-0563	BTS-56K	
R20	39KΩ	1/2	181-0393	BTS-39K	
R21	330KΩ	1/2	181-0334	BTS-330K	
R22	330Ω	1	182-0331	BTA-330	
R23	330KΩ	1/2	181-0334	BTS-330K	
R24	1800Ω	2	183-0182	BTB-1800	
R25	82Ω	1/2	181-0820	BTS-82	
R26	82Ω	1/2	181-0820	BTS-82	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1.5Meg	1/2	154-0005				UF155A	Tone - Panel
B	300KΩ						UR354T74	Volume Tap@ 95KΩ-Rear
C	Bushing						UB214	Attach to R1A
R2	2000Ω with 100Ω stop	1	159-0004					Sensitivity-Wire Wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC ① 4A	480VCT .058ADC			141-0025		P-3068 ①		

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	7.5KΩ CT	3.3Ω	600Ω CT	.32Ω	143-0025	A-3852 ①	A-2901 ①	RO-301 ①	S-51X ①	① Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"X7"	PM	3.3Ω	529-5703	57J9	57A1	① 6"X9" Speaker used on model 238060.
SP2	6"X9"	PM	3.3Ω	539-0006 ①	69J9	69A2	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	10.5Ω		111-0019				
L2	IF Trap			118-0008				Wound on Capacitor
L3	RF Coil	11Ω		112-0011				
L4	Osc. Coil	.9Ω	4.2Ω	113-0044				
L5	Input IF	34Ω	34Ω	121-0020	16-6752	BC-350	12-H1	
L6	Output IF	42Ω	40Ω	122-0022	16-6754	BC-354	12-H6	
L7	Vibrator Hash Choke	0Ω		147-0007			5221	11 Microhenries
L8	Fil. Choke	.2Ω		145-0007				

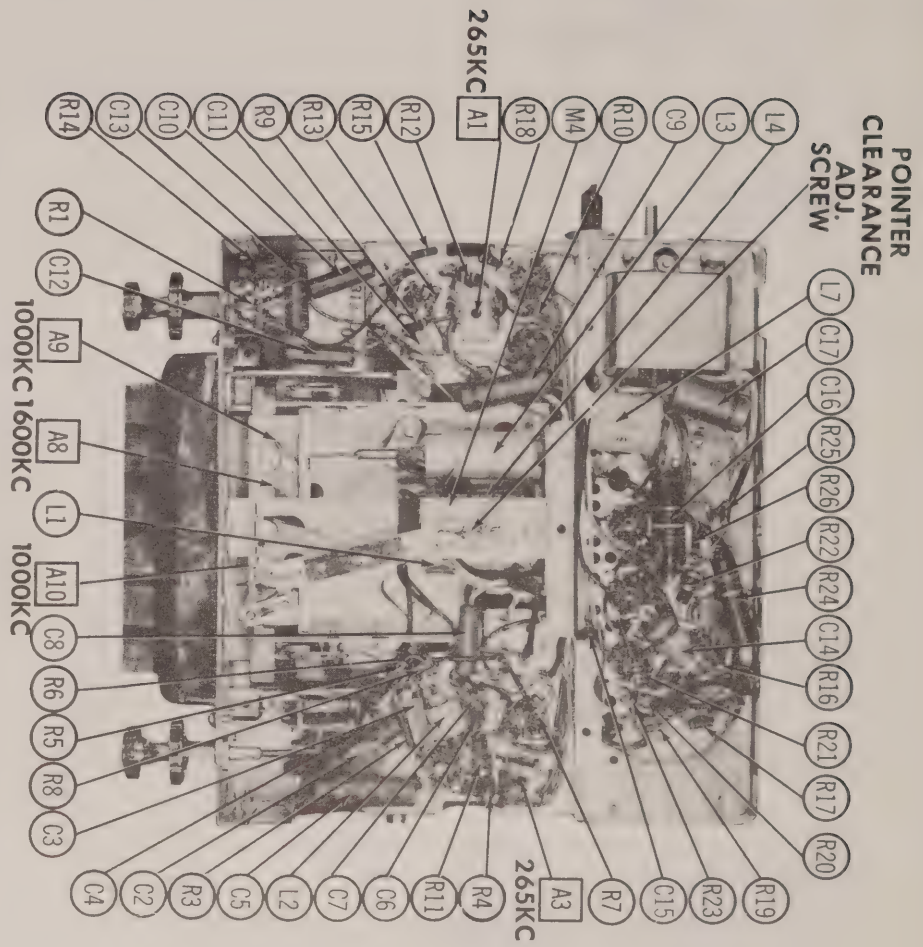
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	191-0002		307014 (SFE-14A)	155014	SFE-14	HDI

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				SYLVANIA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	511-0001	5301	859	5301	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

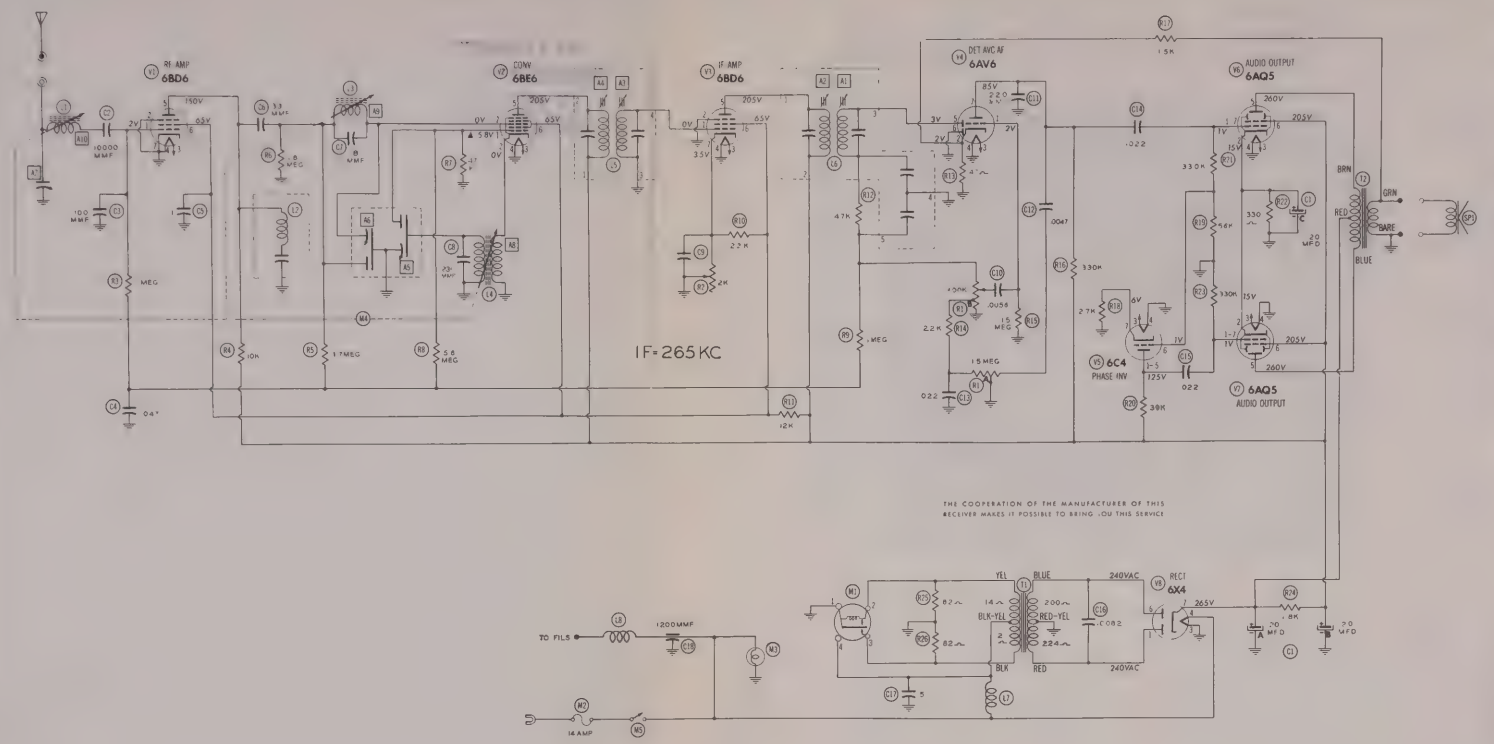
MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Dial Light	611-0044	Type #44
M4	Tuning Assy.	313-0028	Models 236486, and 238060
M5	Switch	571-6004	On/Off
A5	Trimmer Cap.	173-0002	Osc.Grid & Osc.Trimmer
A6	Trimmer Cap.	173-0002	Fixed padder, varible trimmer (RF)
A7	Trimmer Cap.	172-0034	Ant. Trimmer
	Dial	722-0032	
	Escutcheon	711-0030	
	Pointer	791-0024	Dial & Arm Assy.
	Button	752-0030	Push
	Button	752-0029	Push -Off
	Knob	744-0009	Tone Control
	Knob	744-0010	Trim
	Knob	749-0012	Volume & Tuning

PUSHBUTTON & SENSITIVITY CONTROL ADJ.

PUSHBUTTON ADJUSTMENT
Collapse the antenna.
Allow receiver to warm up for 15 minutes.
Unlock push button by pulling to the left and outward.
Tune manually to desired station.
Press the button completely in.
Repeat the procedure with the remaining pushbuttons.

SENSITIVITY CONTROL ADJUSTMENT
The sensitivity control is factory adjusted and should not require readjustment unless it has been tampered with.
If necessary, reset the control to obtain 3.5 volts at pin 7 (cathode) of 6BD6 (V3).



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	1.7Meg	0Ω	.1Ω	0Ω	†12KΩ	†14KΩ	0Ω
V 2	6BE6	47KΩ	.9Ω	.1Ω	0Ω	†1.8KΩ	†14KΩ	1.4Meg
V 3	6BD6	34Ω	0Ω	.1Ω	0Ω	†1.8KΩ	†14KΩ	300Ω
V 4	6AV6	15Meg	47Ω	.1Ω	0Ω	235KΩ	0Ω	†330KΩ
V 5	6C4	40KΩ	INF	.1Ω	0Ω	†40KΩ	56KΩ	2.7KΩ
V 6	6AQ5	390KΩ	330Ω	.1Ω	0Ω	†290Ω	†1.8KΩ	390KΩ
V 7	6AQ5	330KΩ	330Ω	.1Ω	0Ω	†310Ω	†1.8KΩ	330KΩ
V 8	6X4	224Ω	INF	0Ω	.1Ω	INF	200Ω	35KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER.
† MEASURED FROM PIN 7 OF V8.

1. DC Voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% on voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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LINCOLN-MERCURY MODELS
FAF-18805-A (3SM-757), FAG-18805-A (3SH-756)

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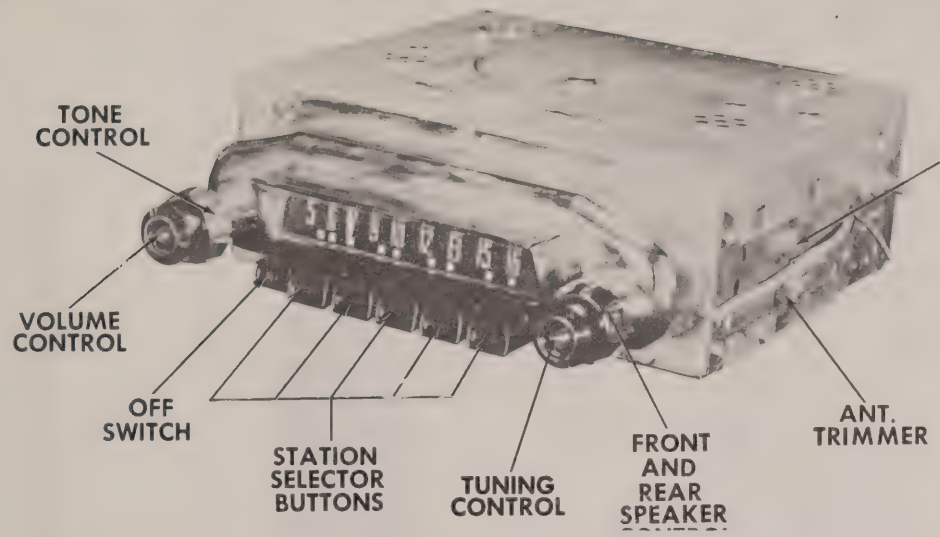
DE ST.
TRADO



TRADE NAME	Lincoln Model FAG-18805-A (Sylvania Model 3SH756), Mercury Model FAF-18805-A (Sylvania Model 3SM757)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & TV Div., 254 Rano St., Buffalo 7, N.Y.
TYPE SET	Battery Operated Custom Built Superheterodyne Receiver for 1953 Lincoln & Mercury Automobiles
TUBES (Eight)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AF Amp., 6AV6 AVC-Phase Inv., (2) 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 6.4 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn the tone control to maximum clockwise position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2) (accessible thru hole in top cover). Low side to chassis.	265KC (400~ Mod.)	Tune to point of non-interference	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. Repeat adjustment until no increase in output is noted.
2.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	Tune manually to high frequency end stop.	"	A5, A6, A7	Adjust in order named for maximum output. If dial calibration is off reset pointer by means of pointer calibration adjusting screw.
	Steps 3, 4 and 5 are to be performed only if a core or coil has been replaced or tampered with.						
3.	Fig. 1	Thru dummy to antenna receptacle	1610KC	Tune manually to high frequency end stop.	Across voice coil	A5	Adjust for maximum output.
4.	"	"	"	"	"	A6, A7	"
5.	"	"	"	1000KC	"	A8, A9, A10	Adjust in order given for maximum output.
6.	Repeat steps 4 and 5 for best calibration and tracking.						

Install receiver in car and allow receiver to warm up for 15 minutes. Extend antenna to maximum height and check adjustment of A7 on a weak signal near 1000KC.

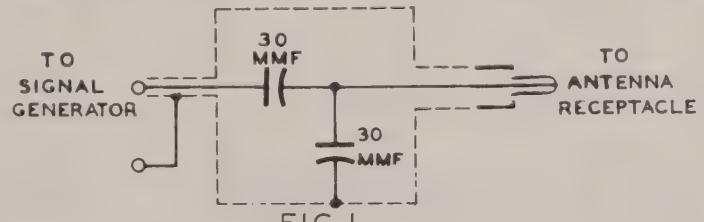


FIG. 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det-AF Amplifier	6AV6	6AV6	7BT	
V5	AVC-Phase Inv.	6AV6	6AV6	7BT	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	350	161-3005	AFH3-107		CO80		FP345.8	TVL-3678	
B	▲20	350								
C	20	25								
C2	10000		168-00027	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	Note 1
C3	150	500	164-0150	1469-00015		5R5T15		MCB236	MS-315	Note 2
C4	.047	200	160-02147	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C5	.1	400	160-0401	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C6	33		163-0033							
C7	18	500	164-0018							
C8	230		165-0230A							
C9	.1	200	160-0201	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C10	10	500	164-0010	1468-00001	D6-100	5W5Q1	GP1K-100	MC215	1FM-41	
C11	.0015	600	160-06215	P688-0015	D6-152	PTE6D15	GP2L-152	PT6215	6TM-D15	
C12	.0056	400	160-04256							
C13	.0056	400	160-04256							
C14	220	500	163-0220	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C15	.022	600	160-06122	P688-022	DF-203	PTE6S22		PT6122	6TM-S22	
C16	10000		168-0002D	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C17	220	500	163-0220	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C18	.022	600	160-06122	P688-022	DF-203	PTE6S22		PT6122	6TM-S22	
C19	.0082	1600	160-16282							
C20	.5	100	169-0001	P185-5		MP2P5			68P20	

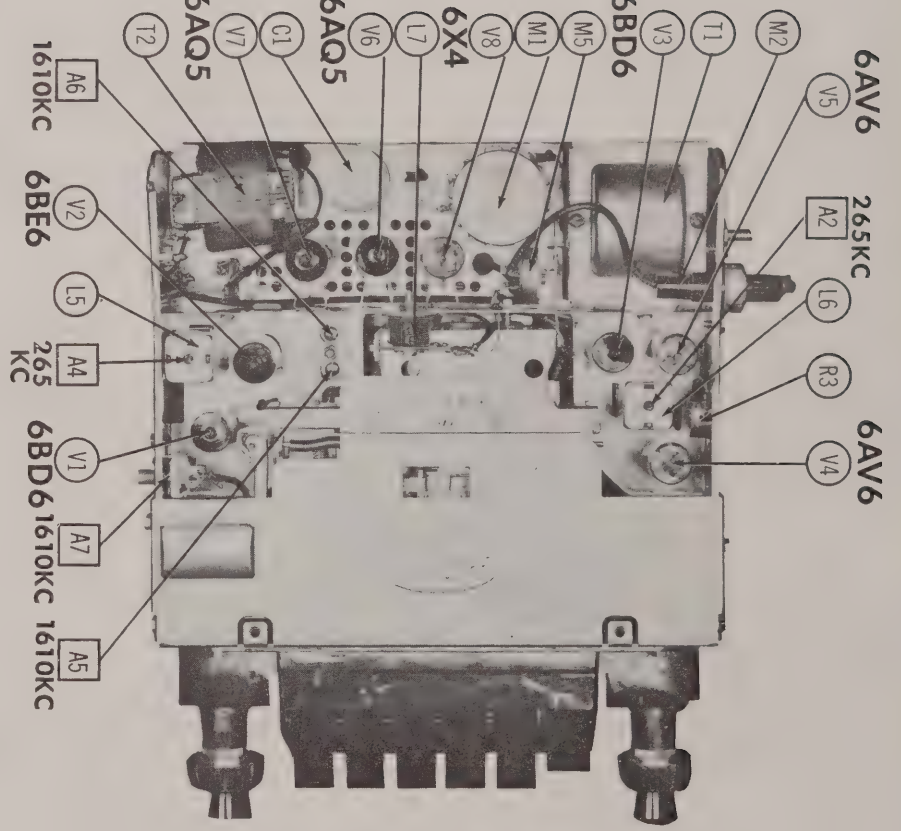
Note 1. Lincoln Model FAG-18805-A uses 5000MMF in this application (Part #166-5000D).
Note 2. Lincoln Model FAG-18805-A uses 100MMF in this application (Part #164-0100).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	Switch		152-0018					Tone Switch-Panel-Note 1
B	1 Meg	½						Volume Tap@ 500KΩ-Rear
R2	10Ω	2	153-3008					Front-Rear Speaker-Wire Wound-Note 2
R3	2000Ω with 100Ω stop	1	159-0004					Sensitivity-Wire Wound

Note 1. Lincoln Model FAG-18805-A uses alternate control. (Part No. 152-0017).
Note 2. Lincoln Model FAG-18805-A uses alternate control. (Part No. 153-3010).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R4	1 Meg	½	181-0105	BTS-1 Meg	
R5	10KΩ	1	182-0103	BTA-10K	
R6	330KΩ	½	181-0334	BTS-330K	
R7	47KΩ	½	181-0473	BTS-47K	
R8	15 Meg	½	181-0156	BTS-15 Meg	
R9	39KΩ	½	181-0393	BTS-39K	
R10	12KΩ	2	183-0123	BTB-12K	
R11	47KΩ	½	181-0473	BTS-47K	
R12	470KΩ	½	181-0474	BTS-470K	
R13	220KΩ	½	181-0224	BTS-220K	
R14	100KΩ	½	181-0104	BTS-100K	
R15	100KΩ	½	181-0104	BTS-100K	
R16	47Ω	½	181-0470	BTS-47	
R17	1500Ω	½	181-0152	BTS-1500	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R18	15 Meg	½	181-0156	BTS-15 Meg	
R19	330KΩ	½	181-0334	BTS-330K	
R20	1 Meg	½	181-0105	BTS-1 Meg	
R21	1 Meg	½	181-0105	BTS-1 Meg	
R22	2700Ω	½	181-0272	BTS-2700	
R23	6.8Meg	½	181-0685	BTS-6.8Meg	
R24	150KΩ	½	181-0154	BTS-150K	
R25	330KΩ	½	181-0334	BTS-330K	
R26	47KΩ	½	181-0473	BTS-47K	
R27	150KΩ	½	181-0154	BTS-150K	
R28	390Ω	1	182-0391	BTA-390	
R29	220KΩ	½	181-0224	BTS-220K	
R30	1800Ω	2	189-0012	BTB-1800	
R31	150Ω	1	182-0151	BTS-150	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC @ 3.5A	475VCT .053A			141-0025		P-3068		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	8.4KΩ	3.5Ω	420Ω CT	.37Ω	143-0024	A-3856 ①	A-2900 ①	R-301 ①	S-51X ①	①Drill one new mtg. hole.

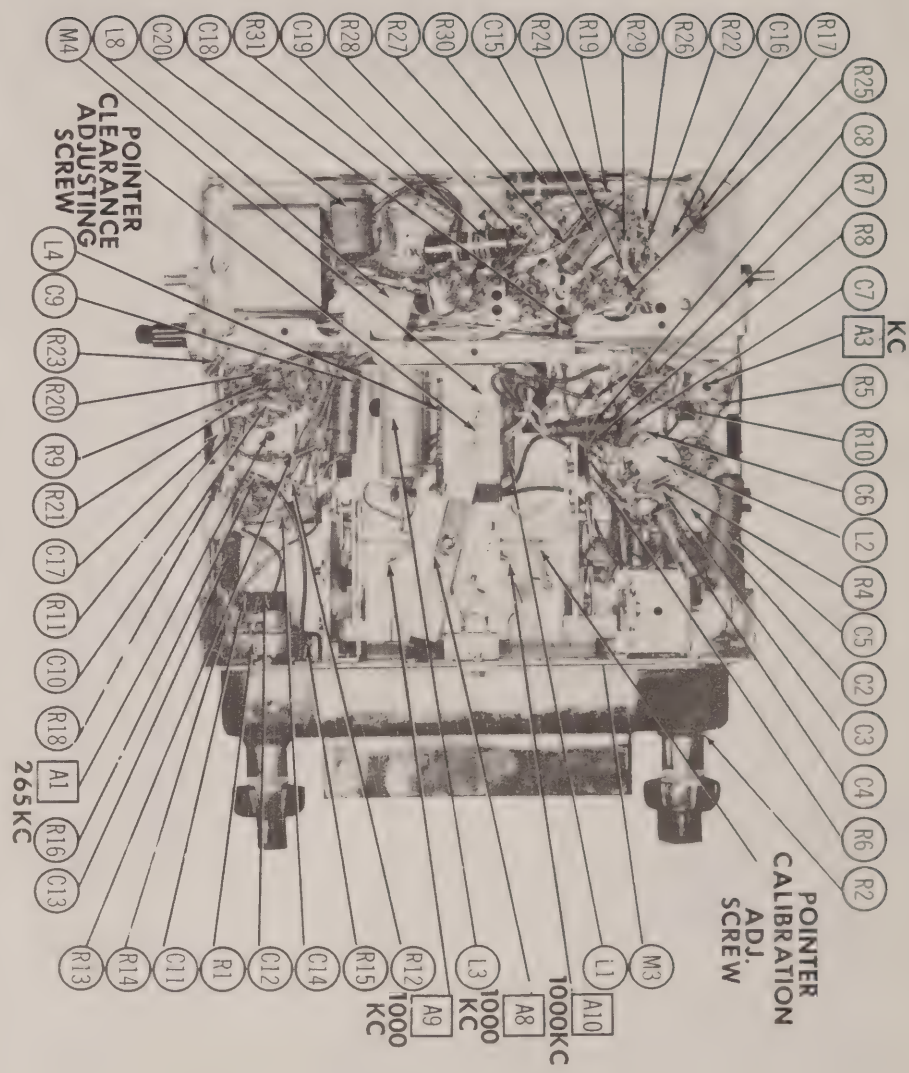
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.5Ω	539-0008 ①	ST-810 Mod. P69-V	69A2	① 6 x 9" speaker used in Model 3SM757 ② 6 x 9" speaker used in Model 3SM756 ③ 5 x 7" rear seat speaker
				539-6901 ②	ST-810 Mod. P69-V		
				539-5702 ③	57J9(Viking)	57A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	12Ω		111-0019				Wound on Capacitor
L2	IF Trap			118-0008				
L3	RF Coil	12.5Ω		112-0011				
L4	Osc. Coil	.5Ω	4.6Ω	113-0024				
L5	Input IF	37Ω	37Ω	121-0020	16-6752	BC-350	12-H1	
L6	Output IF	44Ω	44Ω	122-0022	16-6754	BC-354	12-H6	
L7	Fil. Choke	.2Ω		145-0007				
L8	Vibrator Hash Choke	.04Ω		147-0007			5221	11 Microheneries

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				SYLVANIA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	511-0001	5301	859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	191-0002	562-0008	307014 (SFE-14A)	155014	SFE-14	HRI

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3A	Dial Light	611-0044	Type No. 44 (2 Used) (Model 3SM-757)
B	Dial Light	611-0055	Type No. 55 (2 Used) (Model 3SH-756)
M4A	Tuning Assy.	313-0027	For Model FAF-18805-A (3SM-757)
B	Tuning Assy.	313-0026	For Model FAG-18805-A (3SM-756)
M5	Switch	571-0004	Off-On
M6	Switch	196-0019	Dimmer, Model 3SH-756
A7	Trimmer Capacitor	172-0033	Antenna
A5, A6	Trimmer Capacitor	173-0002	RF & Osc.
	Dial	722-0023	For FAF-18805-A (3SM-757)
	Background Assy.	411-0016	For FAF-18805-A (3SM-757)
	Background Assy.	411-0017	For FAG-18805-A (3SH-756)
	Escutcheon	711-0028	For FAF-18805-A (3SM-757)
	Escutcheon	711-0029	For FAG-18805-A (3SH-756)
	Pointer	791-0022	For FAG-18805-A (3SH-756), FAF-18805-A (3SM-757)
	Push Button	752-0025	For FAG-18805-A (3SH-756), FAF-18805-A (3SM-757)
	Push Button	752-0026	For FAG-18805-A (3SH-756), FAF-18805-A (3SM-757) Off Button.
	Knob	744-0018	Tone & Rear Spkr. For Model FAF-18805-A (3SM-757) 2 Used.
	Knob	740-0031	Tuning & Volume For Model FAF-18805-A (3SM-757) 2 Used.
	Knob	744-0019	Tone & Rear Spkr. For Model FAG-18805-A (3SH-756) 2 Used.
	Knob	744-0032	Tuning & Volume For Model FAG -18805-A (3SH-756) 2 Used.

PUSHBUTTON & SENSITIVITY CONTROL ADJ.

PUSHBUTTON ADJUSTMENT
Turn the set on and allow to warm up.
Turn the push button to the left and outwards to unlock.
Tune manually to desired stations.
Press button all the way in to lock.
Repeat the procedure with the remaining pushbuttons.

SENSITIVITY CONTROL
The sensitivity control is factory preset and should not need adjustment unless it has been tampered with.
To adjust, set control for 4.5 volts at pin 7 (cathode) of 6BD6 (V3).

MASCO
MODELS 52, 52C, 52CR, 52L, 52LR, 52R

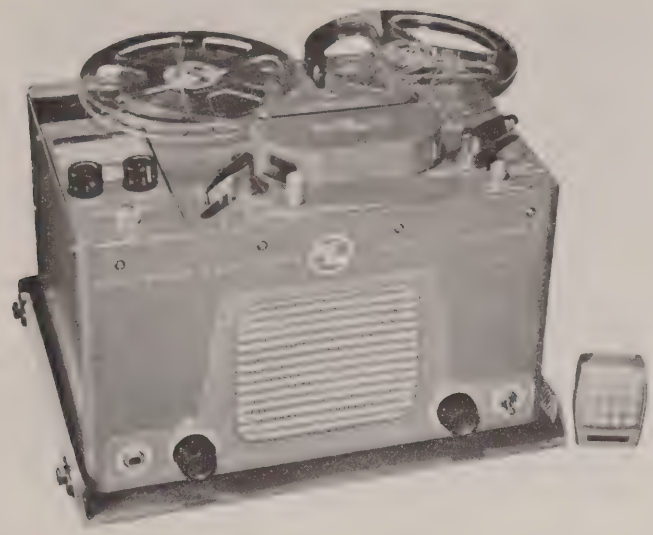


Figure 1

GENERAL INFORMATION

Masco Models 52, 52R, 52L, 52LR, 52C and 52CR Tape Recorders are designed to record two tracks of material on a standard 1/4" width tape at a tape speed of 3.75" per second or 7.50" per second. The mechanism is equipped with a fast rewind requiring approximately 3 minutes for 1200 feet of tape (7" reel). These units have two inputs - Microphone and Radio - Phono. There are three outputs, Internal Speaker, External Speaker (8-16Ω) and External Amplifier.

Recordings may be made from Microphone, External Radio, Phonograph, Tape or Wire Recorder. In Models 52R, 52CR or 52LR recordings may be made directly from the built-in radio.

Variations of the Masco 52 Series Recorders are as follows:

Model 52 Dual speed dual track tape recorder with two-piece carrying case.

Model 52R Same as above with built-in AM radio.

Model 52L Same as Model 52, less carrying case.

Model 52LR Same as above with built-in AM radio.

Model 52C Same as Model 52L, but has hook-hinged metal cover with spring handle on lid. Incorporates power cut-off switch, operating when lid is closed, two locking clasps and key.

Model 52CR Same as above with built-in AM radio.

Connect these units only to an outlet supplying 105-125 volts, 50/60 cycles, AC supply.

Manufactured by:

Mark-Simpson Manufacturing Co., Inc.
32 - 28 Forty Ninth Street
Long Island City 3, New York

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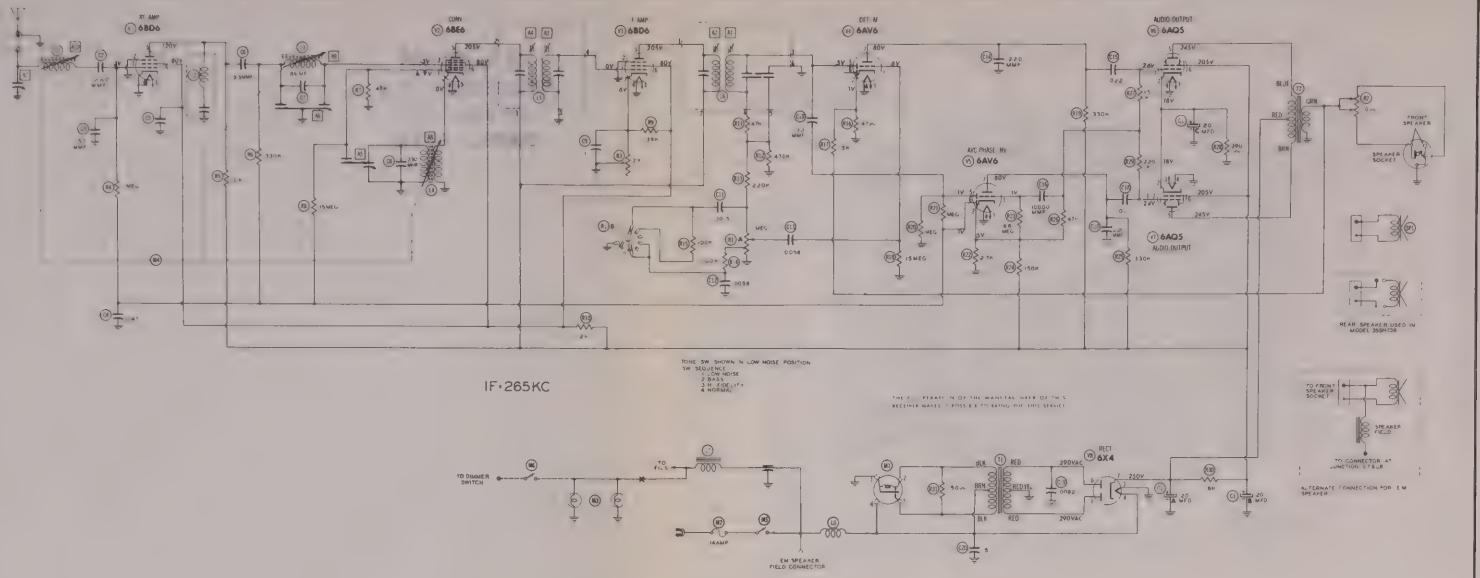

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	3 Meg	0Ω	.1Ω	0Ω	†12KΩ	†14KΩ	0Ω
V 2	6BE6	47K Ω	.5Ω	.1Ω	0Ω	†1.8KΩ	†14KΩ	2.3Meg
V 3	6BD6	37Ω	0Ω	.1Ω	0Ω	†1.8KΩ	†14KΩ	1.5KΩ
V 4	6AV6	15 Meg	47Ω	.1Ω	0Ω	510KΩ	INF	†332KΩ
V 5	6AV6	6.8Meg	2.7KΩ	.1Ω	0Ω	1 Meg	2 Meg	†332KΩ
V 6	6AQ5	200KΩ	390Ω	.1Ω	0Ω	†175Ω	†1.8KΩ	200KΩ
V 7	6AQ5	270KΩ	390Ω	.1Ω	0Ω	†245Ω	†1.8KΩ	270KΩ
V 8	6X4	192Ω	INF	0Ω	.1Ω	INF	212Ω	45KΩ

† MEASURED FROM PIN 7 OF V8.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

1. DC Voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% on voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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MASCO
MODELS 52, 52C, 52CR, 52L, 52LR, 52R

Figure 1

GENERAL INFORMATION

Masco Models 52, 52R, 52L, 52LR, 52C and 52CR Tape Recorders are designed to record two tracks of material on a standard 1/4" width tape at a tape speed of 3.75" per second or 7.50" per second. The mechanism is equipped with a fast rewind requiring approximately 3 minutes for 1200 feet of tape (7" reel). These units have two inputs - Microphone and Radio - Phono. There are three outputs, Internal Speaker, External Speaker (8-16Ω) and External Amplifier.

Recordings may be made from Microphone, External Radio, Phonograph, Tape or Wire Recorder. In Models 52R, 52CR or 52LR recordings may be made directly from the built-in radio.

Variations of the Masco 52 Series Recorders are as follows:

Model 52 Dual speed dual track tape recorder with two-piece carrying case.

Model 52R Same as above with built-in AM radio.

Model 52L Same as Model 52, less carrying case.

Model 52LR Same as above with built-in AM radio.

Model 52C Same as Model 52L, but has hook-hinged metal cover with spring handle on lid. Incorporates power cut-off switch, operating when lid is closed, two locking clasps and key.

Model 52CR Same as above with built-in AM radio.

Connect these units only to an outlet supplying 105-125 volts, 50/60 cycles, AC supply.

Manufactured by:

Mark-Simpson Manufacturing Co., Inc.
32 - 28 Forty Ninth Street
Long Island City 3, New York

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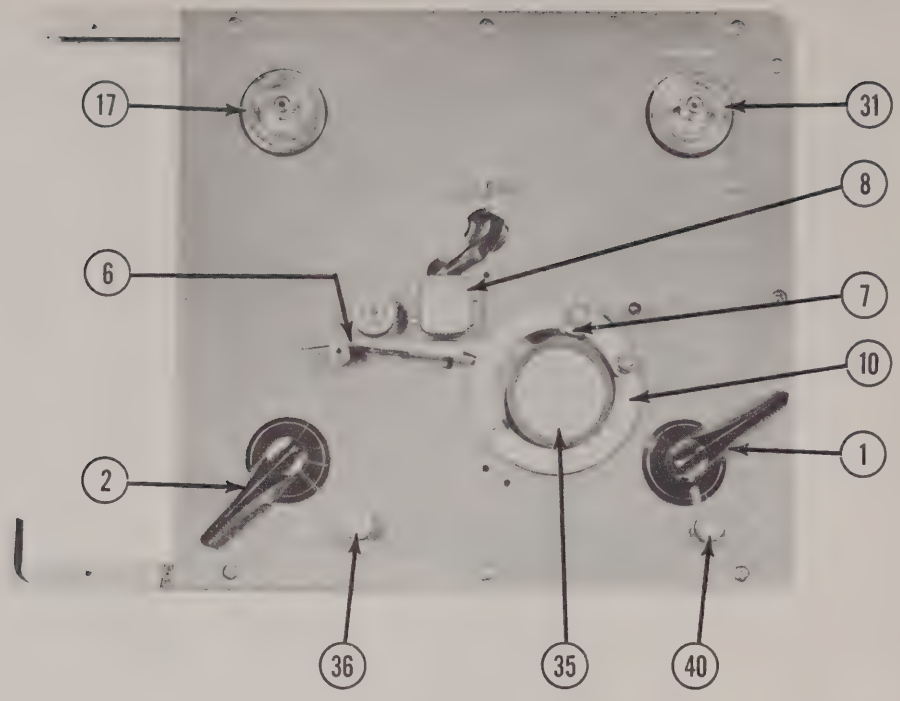

Figure 2

SPECIFICATIONS

Power Consumption-

120 watts at 117 volts, 60 cycles (Models 52, 52C, 52L) 135 watts at 117 volts, 60 cycles (Models 52R, 52CR, 52LR).

Power Output-

5 watts (to internal or external speaker).

Hum Level-

50db below full output.

Frequency Response-

80-8500 cps ± 3db at 7.50" per second. 80-5000 cps ± 3db at 3.75" per second.

Signal-To-Noise Ratio-

45db at 7.50" per second. 40db at 3.75" per second.

Erase and Bias Frequency-

52.5 KC.

Inputs-

Microphone - 1 megohm impedance, .003 volts sensitivity.

Radio-Phono - 0.5 megohm impedance, 0.4 volts sensitivity.

Outputs-

External Speaker - 8-16Ω voice coil, 5 watts.

External Amplifier - 500Ω, 1.7 volts to line or amplifier (any 500Ω or high impedance radio-phono input may be used).

OPERATING INSTRUCTIONS

Preparing The Masco For Recording-

1. Insert the line cord into a convenient wall receptacle of the proper rating.

2. Make certain that control levers (1) and (2) are in the "Off" position.

3. Place the Main Power Switch to "On".

4. Place an empty reel on take-up spindle (31).

5. Place a full reel of tape on supply spindle (17) so that the glossy side of the tape faces outward and the tape will unwind in a counterclockwise direction.

NOTE: This recorder uses Type "A" wound tape, i.e. the dull magnetic coated side faces inward on the reel. If the tape to be used is Type "B" (coated side facing outward) place the reel on the left (supply) spindle, so that the tape will lead-off in a clockwise direction. Bring the tape behind the rear trim cover (not through the head slot) and thread it on the empty reel in the normal manner. Set the mechanism for fast forward operation and allow the full reel of tape to wind on the empty reel. The dull magnetic side of the tape will now be facing inward.

CAUTION: Make sure that the reel slots engage the keys on their respective spindles.

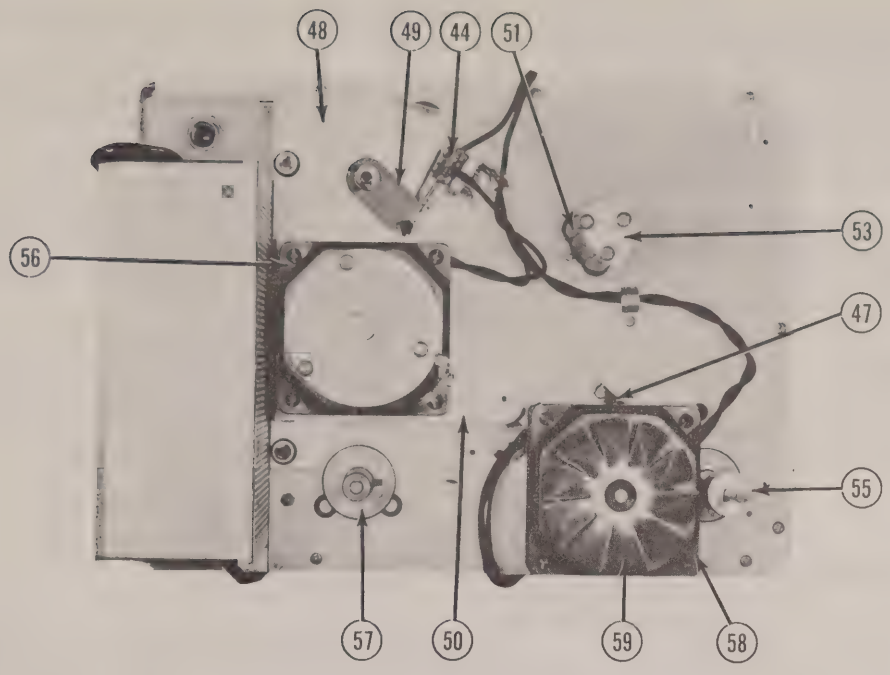

Figure 3

6. Unwind about 2 feet of tape from the supply reel. Drop the tape into the tape slot and run it in front of the tape guide pin which is at the right of the record head housing.

7. Feed the end of the tape through one of the radial slots in the take-up reel. Rotate the reel counterclockwise to make sure the tape is firmly fastened and also to take up all the slack.

Recording From Microphone-

By this time the neon-bulb pilot light should be glowing steadily to indicate that the equipment is warmed up and ready to operate.

1. Plug microphone into Microphone Input.

2. Depress record pushbutton (40). While keeping the button depressed, rotate control lever (1) slowly to "Record" position. The pilot light will now go out and will act as a Recording Volume Level Indicator.

3. Hold the microphone about 6 to 12 inches from the mouth and while speaking into the microphone in a normal tone, rotate the volume control clockwise until the Recording Level Indicator flickers on high peaks. The volume control should not be advanced to a point where the neon bulb glows continuously, to avoid distortion.

4. Turn control knob (2) to "Record". The tape is now moving and whatever enters the microphone will be recorded on the tape.

5. To listen to the recording being made, turn on the internal speaker by means of the Monitor Switch on the tone control, or you may plug in an external speaker (8 to 16Ω voice coil) or headphones at the "External Speaker" jack. The tone control setting has no effect while recording.

NOTE: To record at 7.50 inches per second (for high fidelity reproduction), rotate control knob (2) to "Record" position.

To record at 3.75 inches per second, first depress record pushbutton (40), and while keeping this button firmly depressed, rotate control lever (2) to "Record" position.

To Record From External Radio, Phonograph, Tape Or Wire Recorder-

1. Thread the tape and set the controls as described under "Recording from Microphone".

2. The output of any radio, phonograph, tape or wire recorder may be connected through a suitable cable to the Radio-Phonograph Input. An output of 0.5 volts or more is required.

To Record From Built-In Radio - (Models) 52R, 52CR, 52LR)-

1. Thread the tape on the machine.

2. Turn on Monitor Switch on Tone Control.

3. Turn Radio Switch to "On".

4. Tune in desired station. The hank of antenna wire supplied should be extended about the room or may be connected to an external antenna.

5. Adjust Recording Volume Level Control by means of the Volume Control for correct recording level, as described under "Recording from Microphone" and proceed to record as described in that section.

To Record On The Second Track-

1. Having recorded one track of an entire reel, turn both control levers (1 and 2) to their "Off" positions.

2. Remove both reels; turn the full reel over and place it on the left-hand (supply) spindle, and place the empty reel on the right-hand (take-up) spindle.

3. Thread the tape as described under "Preparing the Masco for Recording". The recorder is now ready to record the second sound track.

NOTE: Since it is impossible to edit and splice one "track" without affecting the other, recordings which are to be edited should be limited to one track only.

To Stop The Recorder-

1. To stop the recorder at any time, always operate control lever (1) First to Stop Tape position slowly, then turn control lever (2) to Stop Tape position.

To Rewind-

1. Stop tape as described above.

2. Place control lever (1) in Rewind position.

3. Place control lever (2) in Rewind position.

4. Turn Volume Control to minimum.

To Change Tape Speeds While Recording-

1. Stop tape by placing control lever (2) only in Stop-Tape position.

2. If recording at 7.50 inches per second and it is desired to change to 3.75, first depress the 3.75 speed change pushbutton (36), and, while keeping this button depressed, turn control lever (2) to Record position.

3. To change from 3.75 inches per second to 7.50 turn control lever (2) back to Record position.

To Use Fast Forward-

1. Rotate control lever (1) to Fast Forward.

2. Rotate control lever (2) to Fast Forward.

3. Rotate fast forward lever (14A) to Fast Forward.

4. To stop Fast Forward rotate fast forward lever (14A) to Stop position until tape stops, then return to Normal position.

To Playback a Recording-

1. Turn Main Power Switch "On".

2. Properly thread the tape on the machine.

3. Turn control lever (1) slowly to Playback position.

4. Turn control lever (2) to Playback position.

5. Adjust Volume and Tone Controls to suit.

To Repair Or Splice Tape-

In case the tape is broken, or it is desired to edit a recording, a splice may be made with splicing tape.

NOTE: Do not use medical adhesive tape as the adhesive material is not suited for this purpose.

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, ect. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excess width.

MAINTENANCE

Lubrication-

The Masco requires no lubrication. Surfaces which are subject to wear are provided with oil-less bearings sealed for a lifetime of operation.

Cleaning the Capstan and Recording Head-

The recording head and capstan are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. This accumulation should be periodically removed since it may cause faint recordings and poor playback. The recording head and capstan may be reached for cleaning by removing the two phillips head screws from the front trim cover (4) and gently lifting off the trim cover. Cleaning is accomplished by means of a cloth dipped in carbon tetrachloride.

TROUBLES

Capstan and Rewind Drive Motor (56) Runs But Mechanism Fails To Operate In Forward Position-

1. Drive wheel spring (25) broken or not connected.
   a. If this spring (25) is not properly connected drive wheel (18) will not be held in firm contact with the motor shaft and flywheel (35).

Tape Moves Past Recording Head But Fails To Wind On Take-Up Reel-

1. Take-up reel drive motor (58) defective.
   a. Check motor connections on switch (44).

2. Grease or oil on take-up reel drive wheel (26).
   a. Clean with carbon tetrachloride.

3. Spring (42) loose or missing.
   a. If spring (42) is not connected to the take-up reel drive wheel throwout lever (39), drive wheel (26) will not be held in firm contact with the motor shaft and take-up reel drive pulley (33).

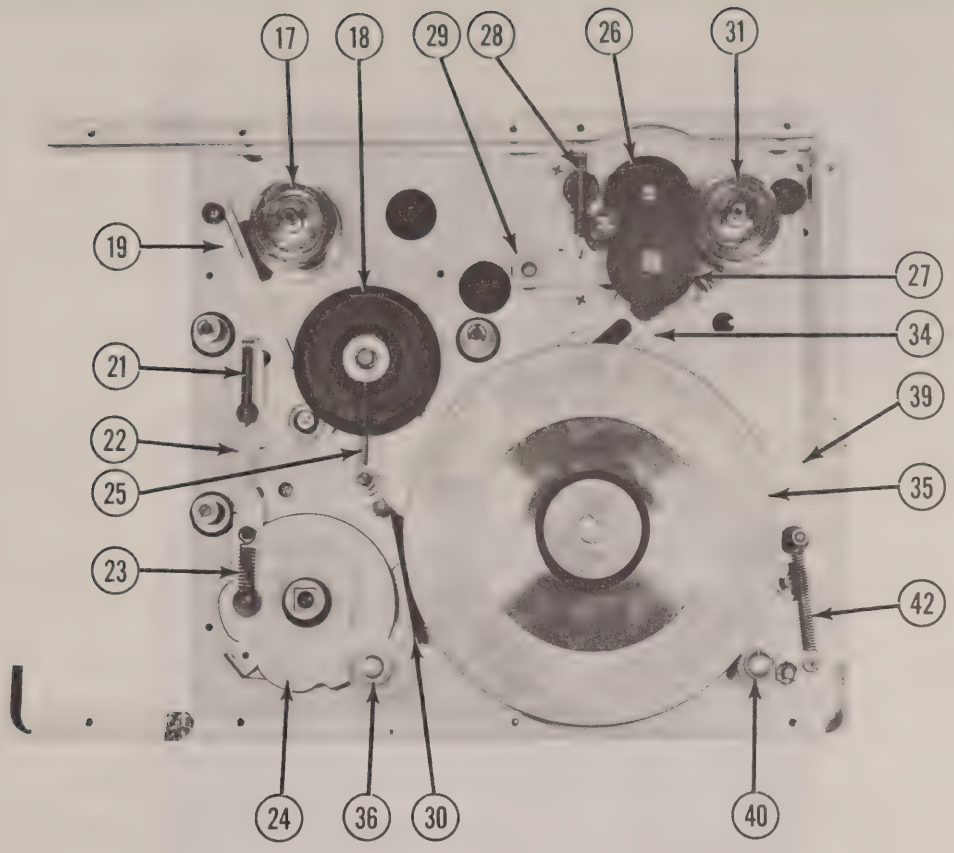

Figure 4

4. Check for grease or oil on felt pad (32).

Speed Variation Or "Wow"-

1. Check motor shaft (56), drive wheel (18) and flywheel and capstan (35) for oil or foreign material on their drive surfaces.
   a. Clean the drive surfaces with carbon tetrachloride.

2. Spring pressure on pressure pad assembly (6) too great.
   a. Remove front trim cover (4) and lift off pressure pad assembly (6).
   b. Bend the leaf spring on the pressure pad so as to relieve some of the pressure on the recording head.
   c. Replace pressure pad assembly and trim cover.

Distortion Or Complete Failure To Record-

1. Pressure pad not being held in firm contact with record head by the lead spring on pad assembly (6).
   a. Remove front trim cover (4).
   b. Remove the pressure pad assembly and bend the lead spring so as to apply more pressure to the record head.
   c. Replace the pressure pad assembly and trim cover.

2. Defective recording head.

3. Check to see if glossy side of recording tape is facing out toward front of mechanism.

4. Defective amplifier.

5. Record push button (40) not held down when control lever (1) is turned to "Record".

Tape From Take-Up Reel Overruns When Control Lever (2) Is Turned From Rewind To Stop-

1. Spring on brake arm (19) broken.

2. Felt pad on brake arm (19) worn or missing.

No Drive In Fast Forward-

1. Fast forward drive wheel tension spring (28) broken or not connected.

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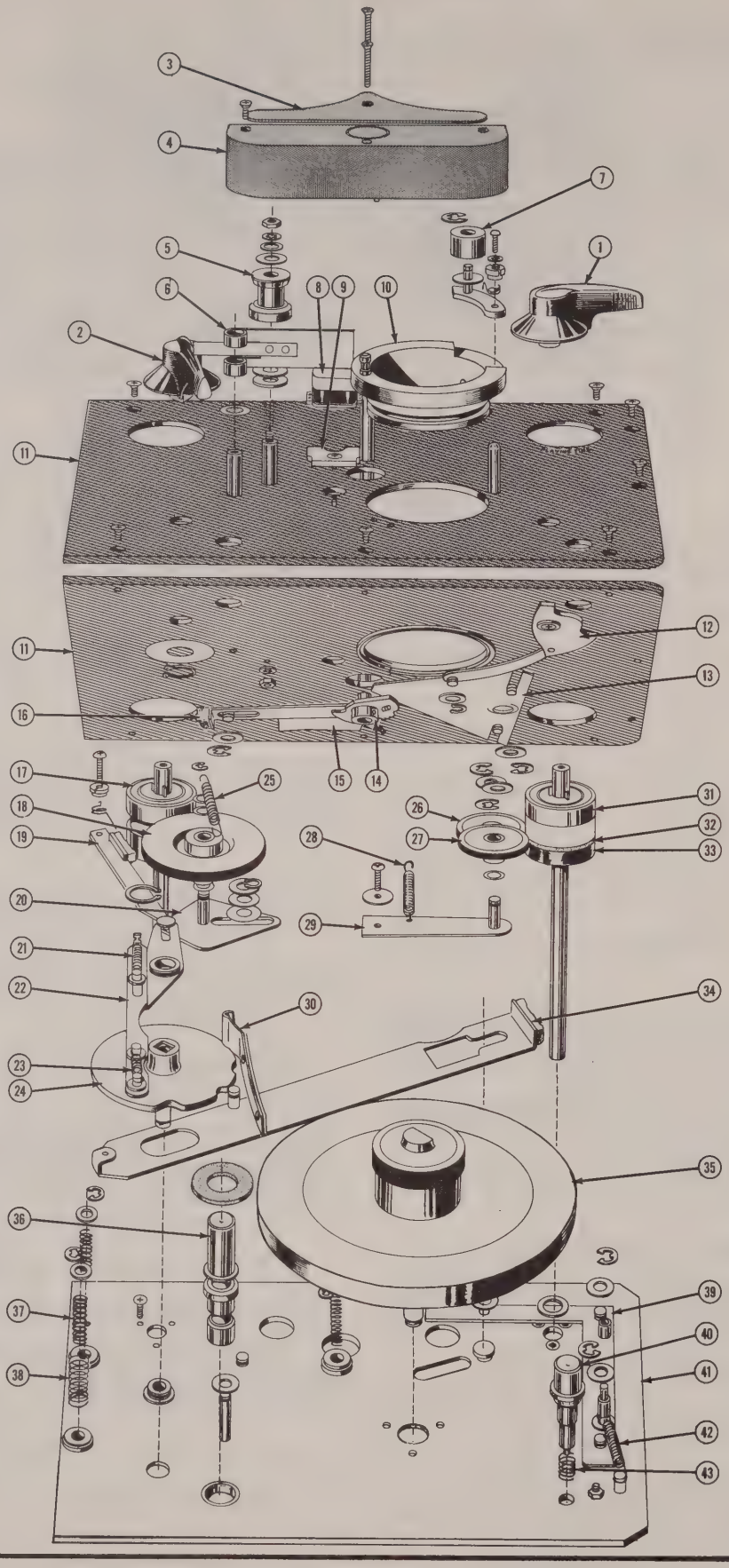

Figure 5A

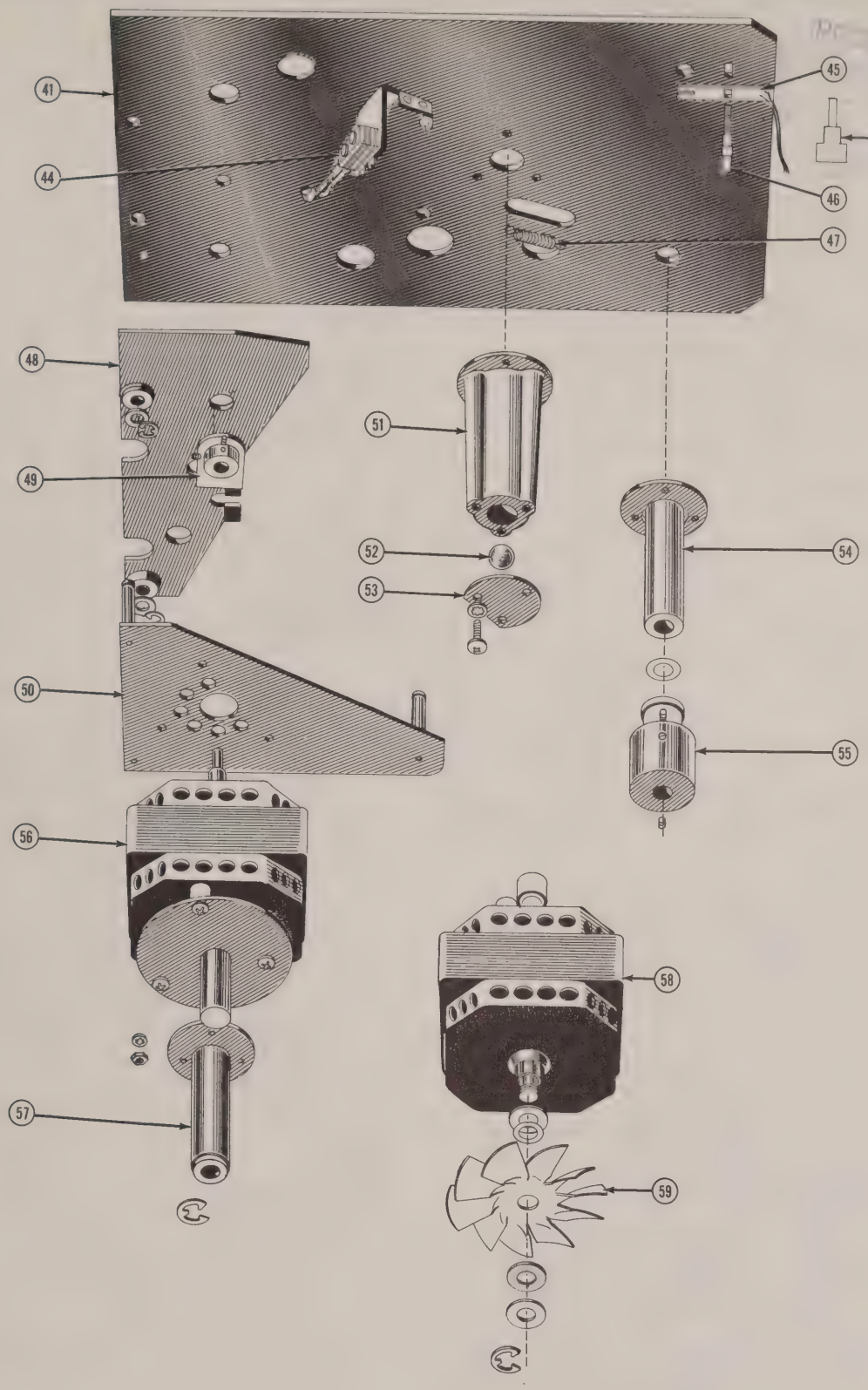

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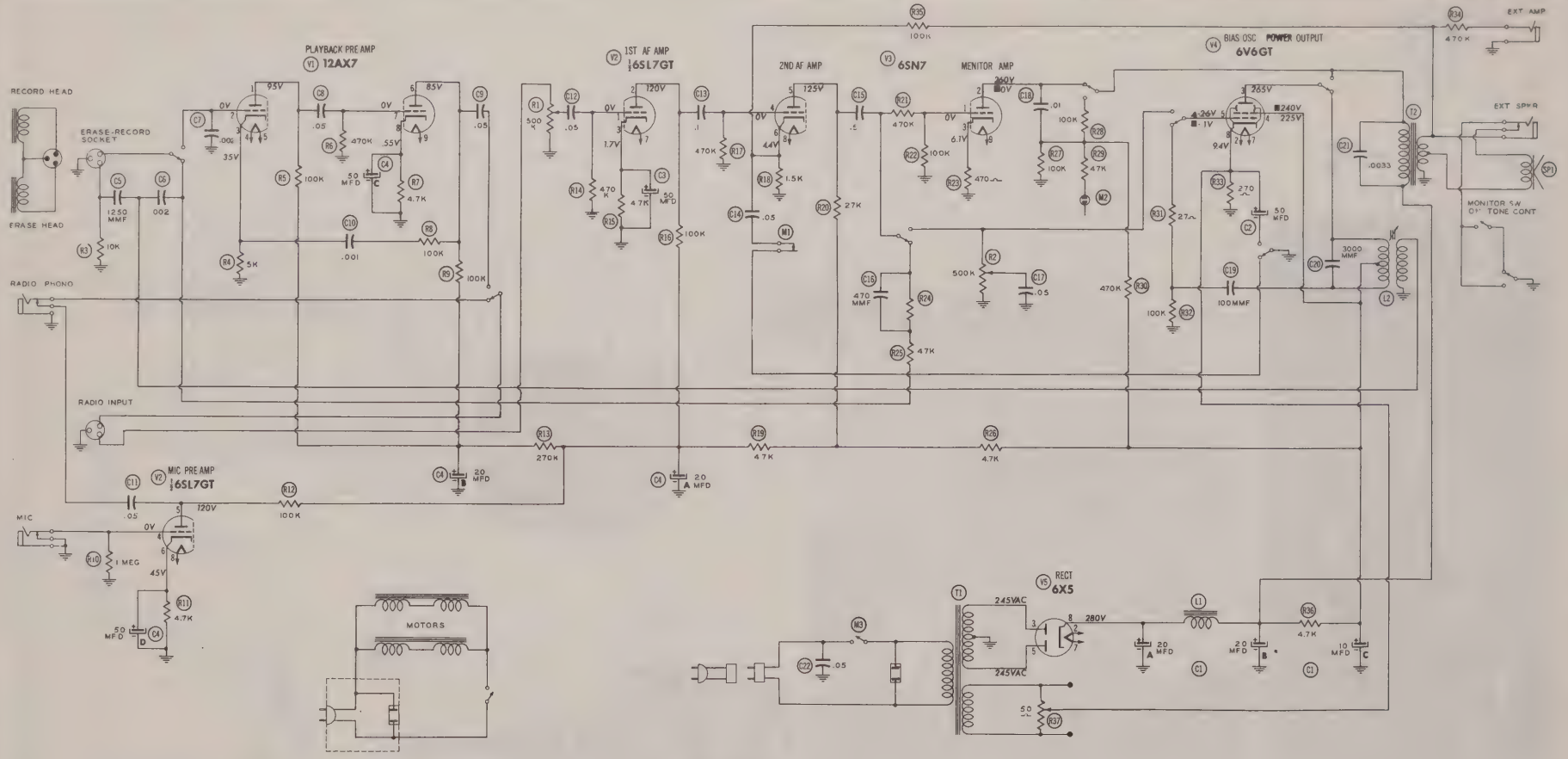
Figure 5B



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	‡430KΩ	*	5KΩ	310Ω	310Ω	‡430KΩ	470KΩ	4.7KΩ	310Ω
V 2	6SL7GT	470KΩ	‡155KΩ	4.7KΩ	0Ω	†155KΩ	4.7KΩ	310Ω	310Ω	
V 3	6SN7GT	87KΩ ■100KΩ	690Ω †INF	470Ω	470KΩ	†37KΩ	1.3KΩ	310Ω	310Ω	
V 4	6V6GT	0Ω	310Ω	5KΩ ‡■690Ω	‡5KΩ	100KΩ ■265KΩ	INF	310Ω	270Ω	
V 5	6X5GT	INF ■690Ω	310Ω	225Ω	INF	200Ω	INF	310Ω	43KΩ	
V 6	6BA6	3.2Meg	0Ω	0Ω	.3Ω	†2.7KΩ	†7.7KΩ	150Ω		
V 7	6BE6	15KΩ	.5Ω	0Ω	.3Ω	†2.7KΩ	†12.7KΩ	6.4Ω		
V 8	6SF7	0Ω	3.2Meg	270Ω	†7.4KΩ	520KΩ	†2.7KΩ	.3Ω	0Ω	

ALL MEASUREMENTS TAKEN IN "RECORD" POSITION UNLESS OTHERWISE SPECIFIED.
■ MEASURED IN "PLAY-BACK" POSITION.
‡ MEASURED FROM PIN 8 OF V5.
† MEASURED FROM OUTPUT OF M4.
* DO NOT MEASURE.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

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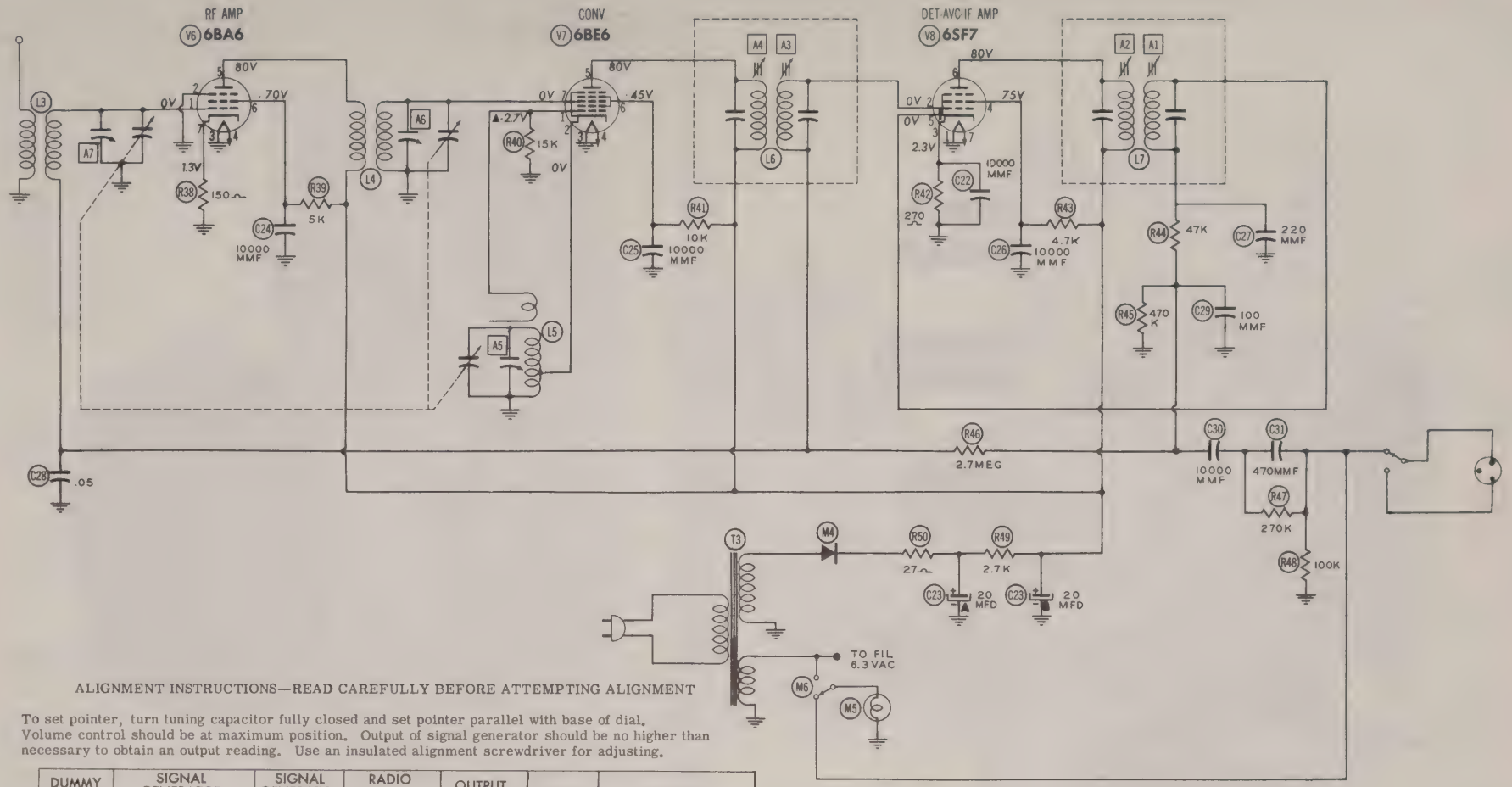

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd.	High side to stator on center section of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	250mfd.	High side to ant. terminal on L3 (remove hank ant.). Low side to chassis.	1500KC	Tune for maximum output.	"	A6, A7	"

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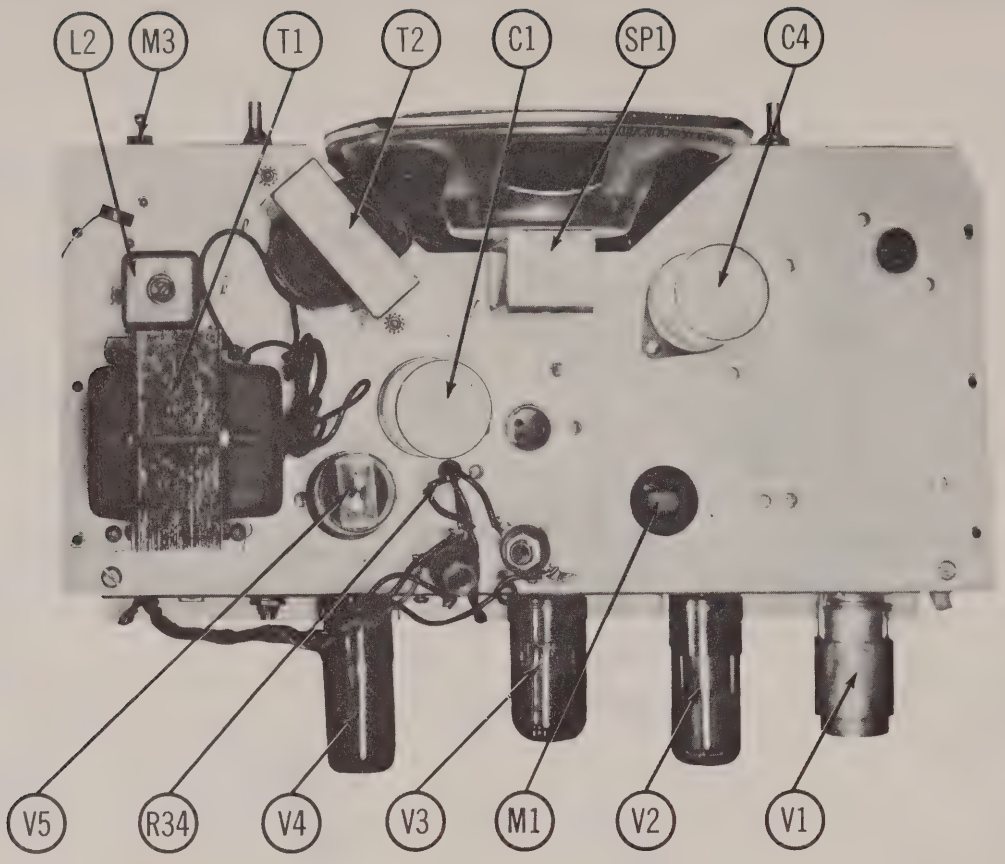

Figure 6

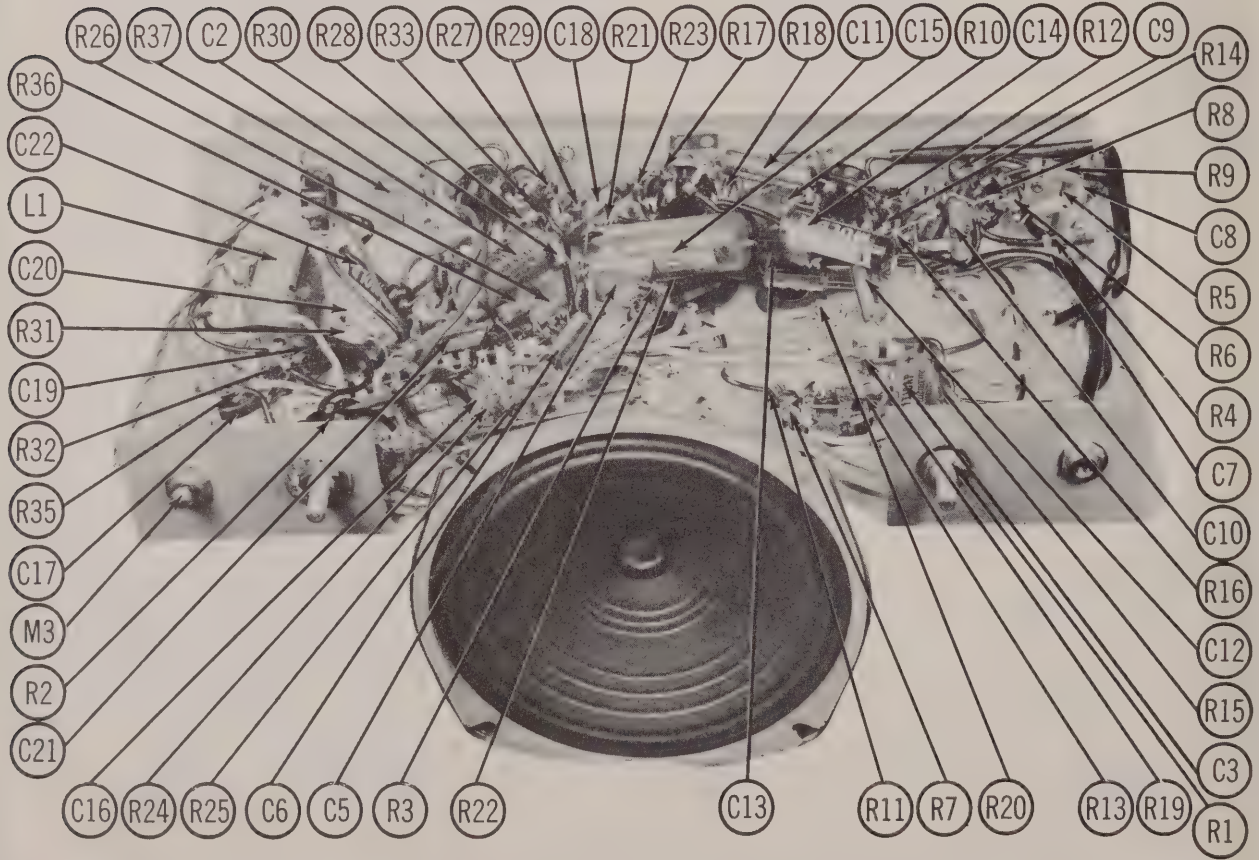

Figure 7

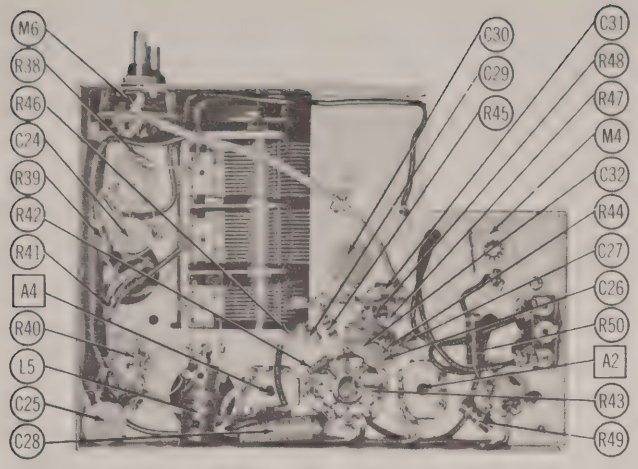

Figure 8

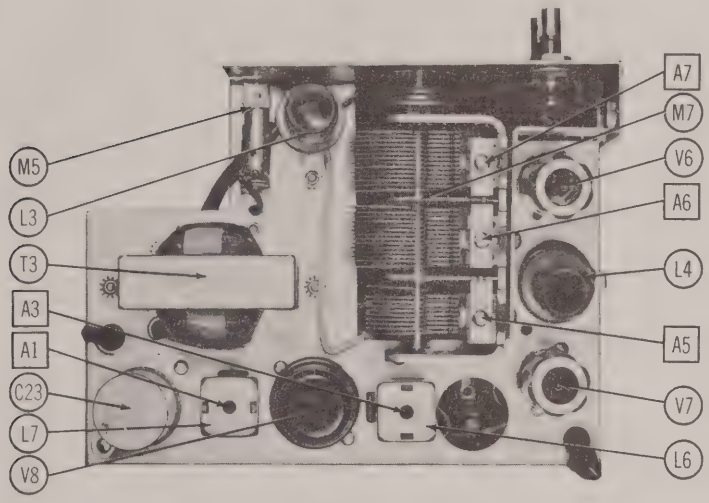

Figure 9

MECHANICAL PARTS LIST

Ref. No.	Description
1	Control Lever - Right Hand
2	Control Lever - Left Hand
3	Rear Trim Cover
4	Front Trim Cover
5	Tape Guide
6	Tape Pressure Pad Assembly
7	Tape Turret Roller
8	Record and Erase Head
9	Recording Head Mounting Plate
10	Capstan Turret
11	Top Plate
12	Actuating Cam & Arm for Turret
13	Actuating Plate for Fast Forward
14	Fast Forward Cam
15	Cam Detent Spring
16	Fast Forward Brake
17	Supply Reel Spindle
18	Rewind and Capstan Drive Wheel
19	Brake Arm for Supply Reel
20	Mounting Plate for item 18
21	Tension Spring for Drive Wheel Pivot Arm
22	Drive Wheel Pivot Arm
23	Tension Spring
24	Control Cam
25	Tension Spring for Drive Wheel

Ref. No.	Description
26	Take-Up Reel Drive Wheel
27	Fast Forward Drive Wheel
28	Tension Spring for Fast Forward Drive Wheel Pivot Arm
29	Fast Forward Drive Wheel Pivot Arm
30	Flywheel and Capstan Brake
31	Take-Up Reel Spindle
32	Felt Pad
33	Take-Up Reel Drive Pulley
34	Control Lever
35	Flywheel and Capstan
36	3.75 Speed Change Push Button
37	Spring - Heavy (1 Used)
38	Spring - Light (3 Used)
39	Take-Up Reel Drive Wheel Throw-out Lever
40	Record Push Button
41	Main Base Plate
42	Tension Spring for item 39
43	Compression Spring for item 40
44	Switch
45	Actuating Lever for Record Position
46	Pivot Link for item 45
47	Tension Spring for item 34
48	Motor Shifting Plate
49	Switch Actuating Cam

MECHANICAL PARTS LIST (CON'T)

Ref. No.	Description
50	Motor Mounting Plate
51	Flywheel Bearing Shaft
52	Ball Bearing
53	Bearing Cover
54	Take-Up Spindle Bearing Shaft
55	Take-Up Spindle Retaining Hub
56	Capstan and Rewind Drive Motor
57	Supply Spindle Bearing Shaft
58	Take-Up Reel Drive Motor
59	Motor Fan

ELECTRICAL PARTS LIST (AMPLIFIER)

Ref. No.	Description
V1	12AX7, Playback Pre-Amplifier
V2	6SL7GT, Mic. Pre-Amp. —1st. AF Amp.
V3	6SN7, 2nd AF Amp. —Monitor Amp.
V4	6V6GT, Bias Osc. —Power Output
V5	6X5GT, Rectifier
C1A	20Mfd. @ 450V.
C1B	20Mfd. @ 450V.
C1C	10Mfd. @ 450V.
C1D	10Mfd. @ 450V.
C2	50Mfd. @ 50V.
C3	50Mfd. @ 50V.
C4A	20Mfd. @ 250V.
C4B	20Mfd. @ 250V.
C4C	50Mfd. @ 25V.
C4D	50Mfd. @ 25V.
C5	1250 Mmf. @ 500V.
C6	.002 Mfd. @ 600V.
C7	.002 Mfd. @ 600V.
C8	.05 Mfd. @ 200V.
C9	.05 Mfd. @ 200V.
C10	.001 Mfd. @ 600V.
C11	.05 Mfd. @ 200V.
C12	.05 Mfd. @ 200V.
C13	.1 Mfd. @ 200V.
C14	.05Mfd. @ 400V.
C15	.5 Mfd. @ 400V.
C16	470 Mmf.
C17	.05 Mfd. @ 400V.
C18	.01 Mfd. @ 600V.
C19	100 Mmf.
C20	3000 Mmf. @ 500V.
C21	.0033 Mfd. @ 600V.
C22	.05 Mfd. @ 400V.
R1	Volume Control, 500 KΩ, 1/2 Watt
R2	Tone Control, 500 KΩ, 1/2 Watt
R3	10 KΩ, 1/2 Watt
R4	5000 Ω, 1/2 Watt W. W.
R5	100 KΩ, 1Watt
R6	470 KΩ, 1/2 Watt
R7	4.7 KΩ, 1/2 Watt
R8	100KΩ, 1/2 Watt
R9	100 KΩ, 1 Watt
R10	1 Meg., 1/2 Watt
R11	4.7 KΩ, 1/2 Watt
R12	100 KΩ, 1/2 Watt
R13	270 KΩ, 1/2 Watt
R14	470 KΩ, 1/2 Watt
R15	4.7 KΩ, 1/2 Watt
R16	100 KΩ, 1/2 Watt
R17	470 KΩ, 1/2 Watt
R18	1.5 KΩ, 1/2 Watt
R19	47 KΩ, 1/2 Watt
R20	27 KΩ, 1/2 Watt
R21	470 KΩ, 1/2 Watt
R22	100 KΩ, 1/2 Watt
R23	470 Ω, 1/2 Watt
R24	150 KΩ, 1/2 Watt
R25	47 KΩ, 1/2 Watt
R26	4.7 KΩ, 1 Watt
R27	100 KΩ, 1/2 Watt
R28	100 KΩ, 1/2 Watt
R29	47KΩ, 1/2 Watt
R30	470 KΩ, 1/2 Watt
R31	27 Ω, 1/2 Watt
R32	100 KΩ, 1/2 Watt
R33	270 Ω, 1 Watt
R34	470 Ω, 1/2 Watt
R35	10 KΩ, 1/2 Watt
R36	4.7 KΩ, 1 Watt
R37	50 Ω, 1 Watt W. W.
T1	Power Transformer
T2	Output Transformer
SP1	Speaker (PM)
L1	Filter Choke
L2	Oscillator Coil
M1	Equalization Switch, Speed Change
M2	Neon Recording Indicator & Pilot Light
M3	Power Switch

ELECTRICAL PARTS LIST (RADIO TUNER)

Ref. No.	Description
V6	6BA6, RF Amplifier
V7	6BE6, Converter
V8	6SF7, Det. -AVC-IF Amp.
C23A	20 Mfd. @ 150V.
C23B	20 Mfd. @ 150V.
C24	10,000 Mmf.
C25	10,000 Mmf.
C26	10,000 Mmf.
C27	220 Mmf., Some Models use 100 Mmf. in this application.
C28	.05 Mfd. @ 200V.
C29	100 Mmf.
C30	10,000 Mmf.
C31	470 Mmf.
C32	10,000 Mmf.
R38	150 Ω, 1/2 Watt
R39	5000 Ω, 1/2 Watt W. W.
R40	15 KΩ, 1/2 Watt
R41	10 KΩ, 1/2 Watt
R42	270 Ω, 1/2 Watt
R43	4.7 KΩ, 1/2 Watt
R44	47 KΩ, 1/2 Watt
R45	470 KΩ, 1/2 Watt
R46	2.7 Meg., 1/2 Watt
R47	270 KΩ, 1/2 Watt
R48	100 KΩ, 1/2 Watt
R49	2.7 KΩ, 1 Watt, Some Models use 2.2 KΩ, resistor in this application.
R50	27 Ω, 1 Watt, Some Models use 18Ω resistor in this application.
T3	Filament Isolation Transformer
L3	Antenna Coil
L4	RF Coil
L5	Oscillator Coil
L6	Input IF
L7	Output IF
M4	Selenium Rectifier, 65MA
M5	Pilot Lamp, Type #47
M6	Radio On-Off Switch
M7	Tuning Cap

PHOTOFACT* Folder

OLYMPIC MODELS 21C65, 21C68, 21C72, 21C73, 21D60, 21D64, 21K61, 21K62, 21K63B, 21T58, 21T69, 21T70, 21T74 (Ch. TN)

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MODEL 21K61

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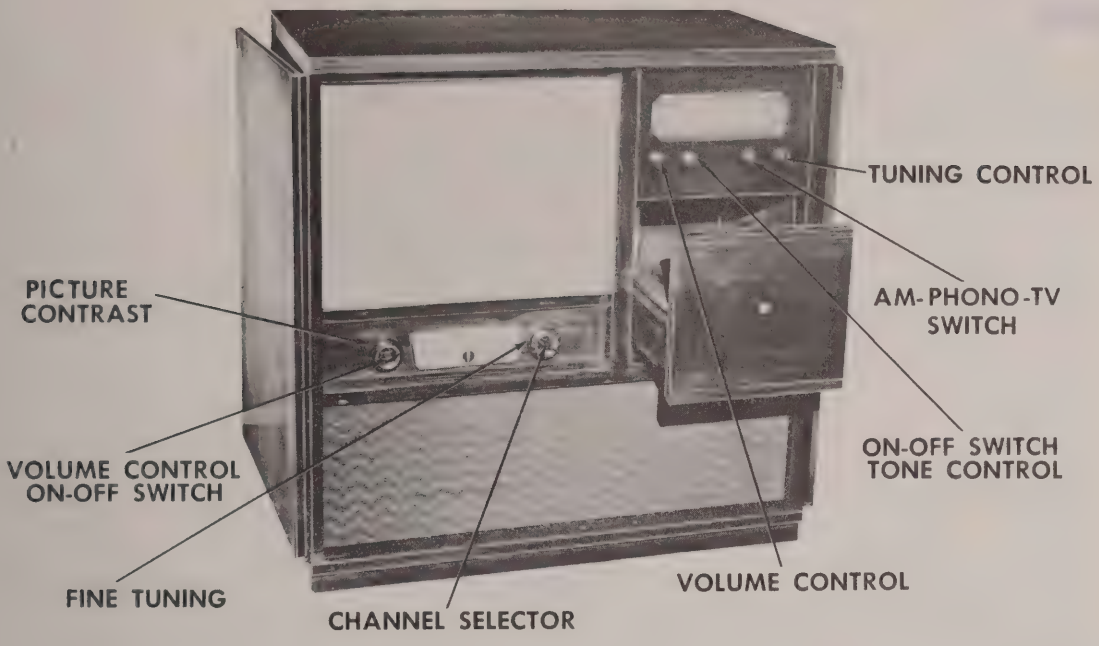

OLYMPIC MODELS
21C65, 21C68, 21C72, 21C73, 21D60, 21D64, 21K61, 21K62, 21K63B, 21T58, 21T69, 21T70, 21T74 (Ch. TN)

OLYMPIC MODEL 21K61

TRADE NAME	Olympic Models 21C65, 21C68, 21C72, 21C73, 21D60, 21D64, 21K61, 21K62, 21K63B, 21T58, 21T69, 21T70, 21T74 (Ch. TN)
MANUFACTURER	Olympic Radio & Television, Inc., 34-01 38th. Ave., Long Island City 1, N.Y.
TYPE SET	TV-Radio-Phono Combination Receiver
TUBES	Twenty (TV only), Twenty-five (with radio) (Models 21K61, 21K62, 21K63B)
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING (TV) 1.8 Amp. @ 117 Volts AC, (Radio) .25 Amp. @ 117 Volts AC
TUNING RANGE	TV Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier) AM Radio 540-1620KC, AM IF 455KC

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FOR SERVICE INFORMATION ON RECORD CHANGER, SEE V-M MODEL 950, PHOTOFACT SET 107, FOLDER 13, ALSO, SUPPLEMENT SET 131 FOLDER 17, OR RECORD CHANGER MANUAL CM-3.

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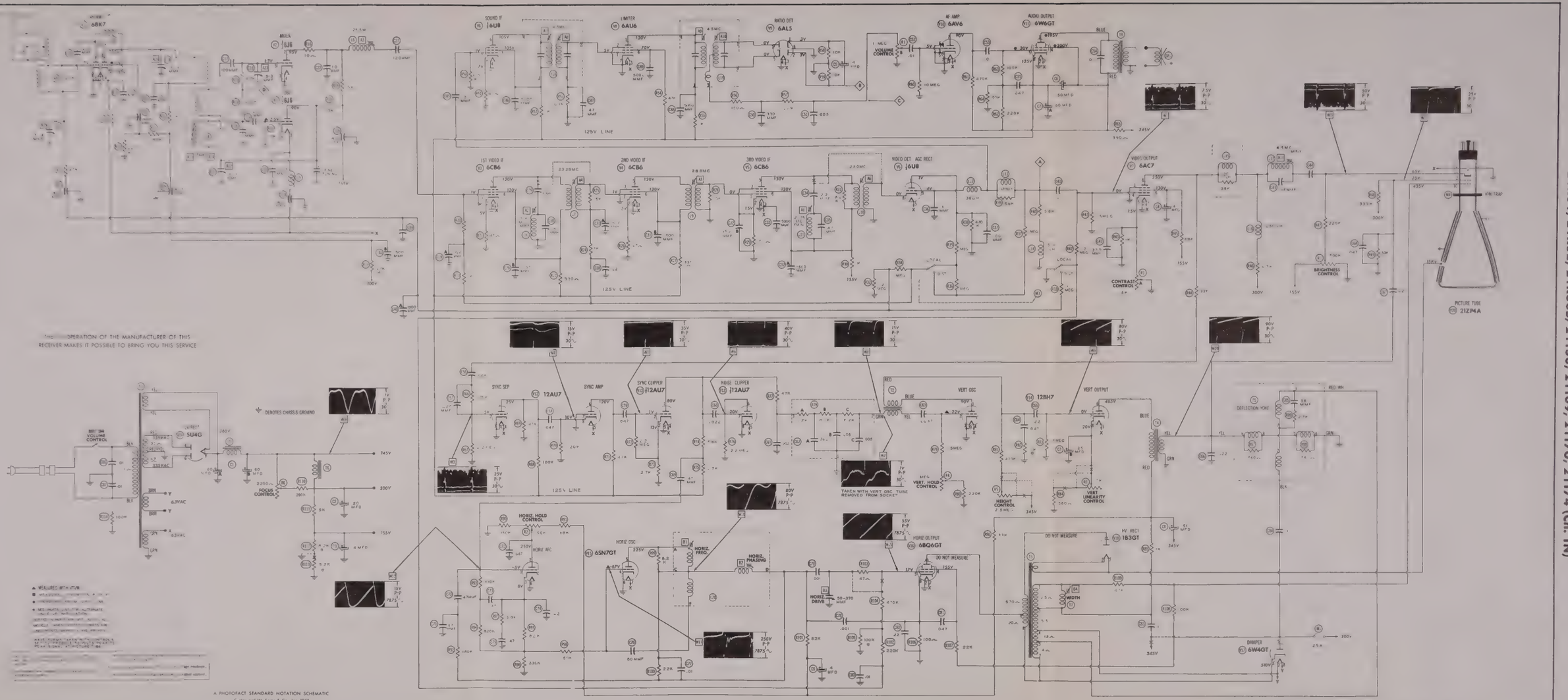
OLYMPIC MODELS 21C65, 21C68, 21C72, 21C73, 21D60, 21D64, 21K61, 21K62, 21K63B, 21T58, 21T69, 21T70, 21T74 (Ch. TN)
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953
OLYMPIC MODELS 21C65, 21C68, 21C72, 21C73, 21D60, 21D64, 21K61, 21K62, 21K63B, 21T58, 21T69, 21T70, 21T74 (Ch. TN)

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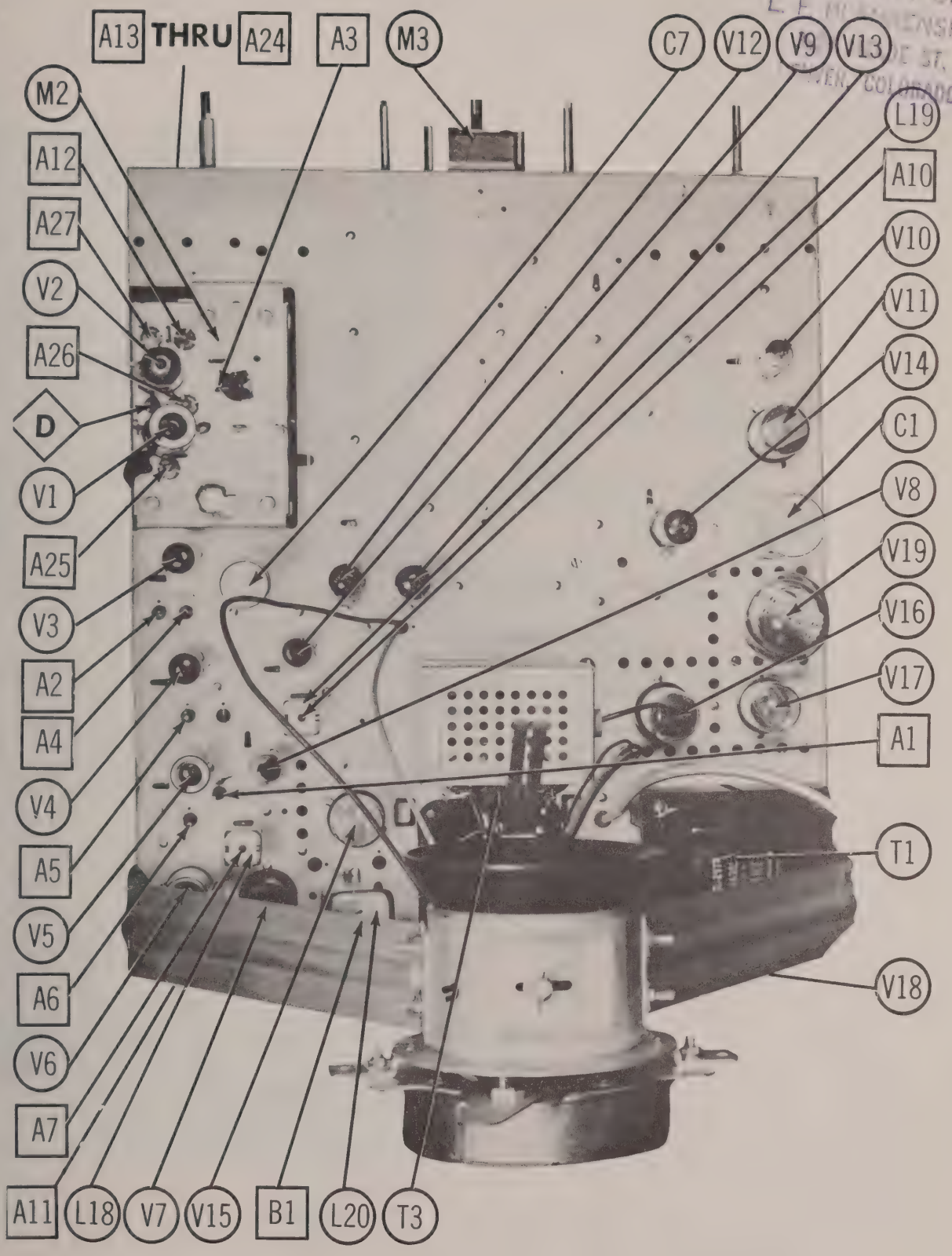
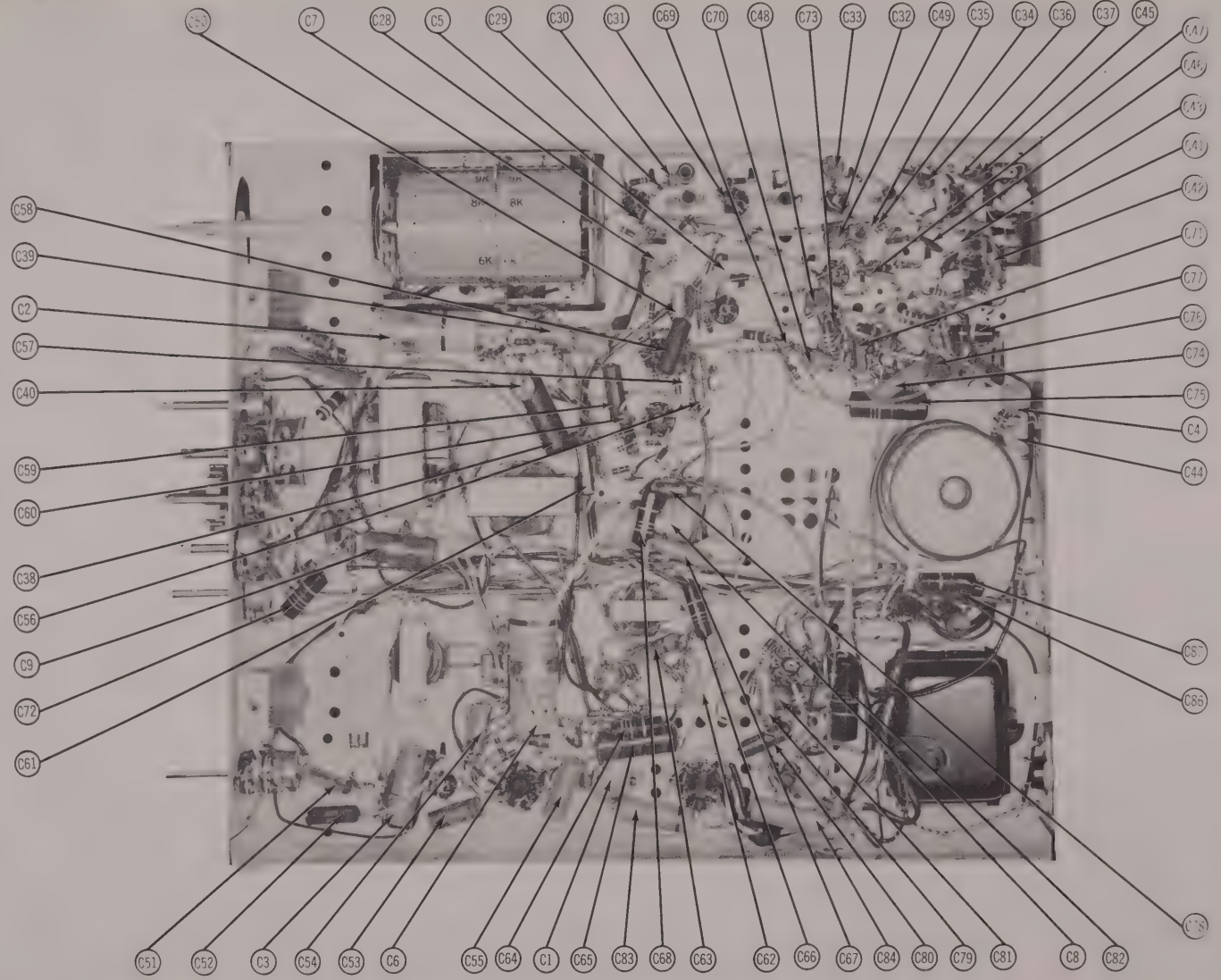
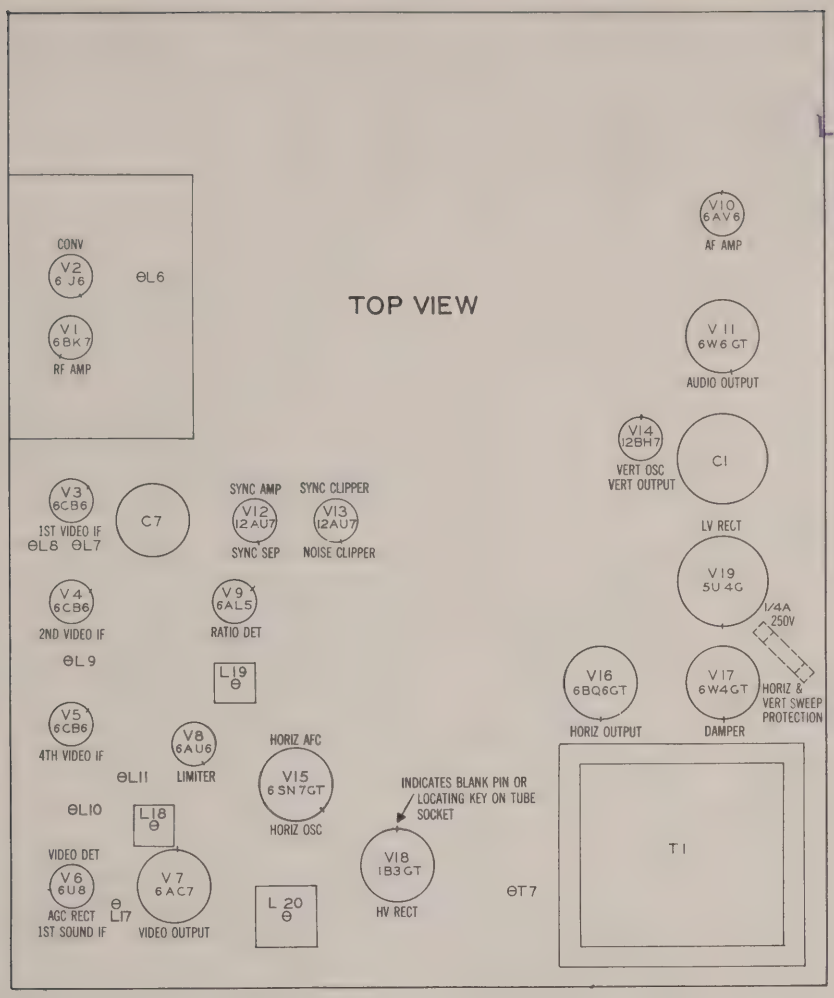


TV CHASSIS TOP VIEW



TV CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V11
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V20
Has pic, no sound - V6, V8, V9, V10, V11

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V15
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20, Fuse (M1)
No vertical deflection - V14
Poor vert. linearity or foldover - V14
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19
Vert. off freq. - V13, V14
Horiz. off freq. - V13, V15

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube, V15.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	21.75MC (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	27.75MC	"	"	A2	"
3.	"	"	25.5MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	23.25MC	"	"	A4	"
5.	"	"	26.0MC	"	"	A5	"
6.	"	"	23.0MC	"	"	A6	Adjust for maximum deflection. If oscillation occurs during adjustment of A3, A4, A5, or A6 turn A4 counter clockwise until screw projects approximately 3/4 inch. Then adjust A3, A5 and A6 as indicated above and follow with adjustment of A4 as in Step 4.

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C38.
Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set Local-Distance switch to "Local" position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.75MC 23.5MC 26.25MC 27.75MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary retouch A3 thru A6 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5KC	Any	Vert. Amp. to point (B). Low side to chassis.	A7, A8 A9	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
9.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A10	Reconnect capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

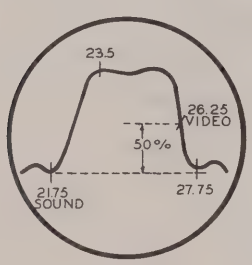


FIG. 1

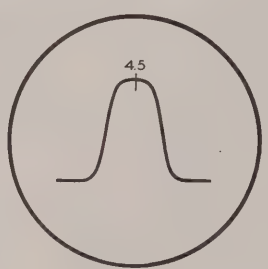


FIG. 2

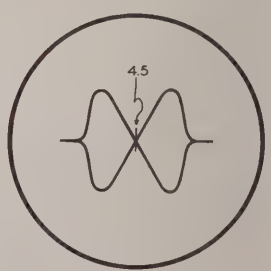


FIG. 3

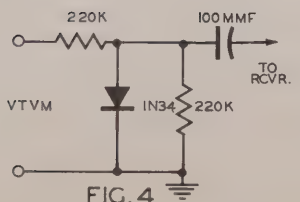


FIG. 4

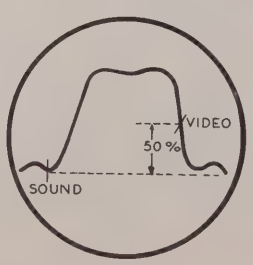


FIG. 5

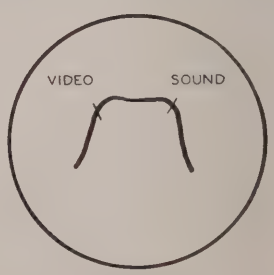


FIG. 6

TV ALIGNMENT INSTRUCTIONS (CONT.)

4.5MC TRAP ALIGNMENT

Turn contrast control fully clockwise.
Remove 6CB6 (V5) from its socket to prevent noise from masking the output indication.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector to pin 11 (cathode) of picture tube. Common to chassis.	All	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the bias battery as under Overall Video IF Response Check.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of A12 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A25, A26, A27	Adjust for response curve similar to Fig. 6.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make slight compromise adjustment of A25, A26 and A27 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RADIO ALIGNMENT INSTRUCTIONS

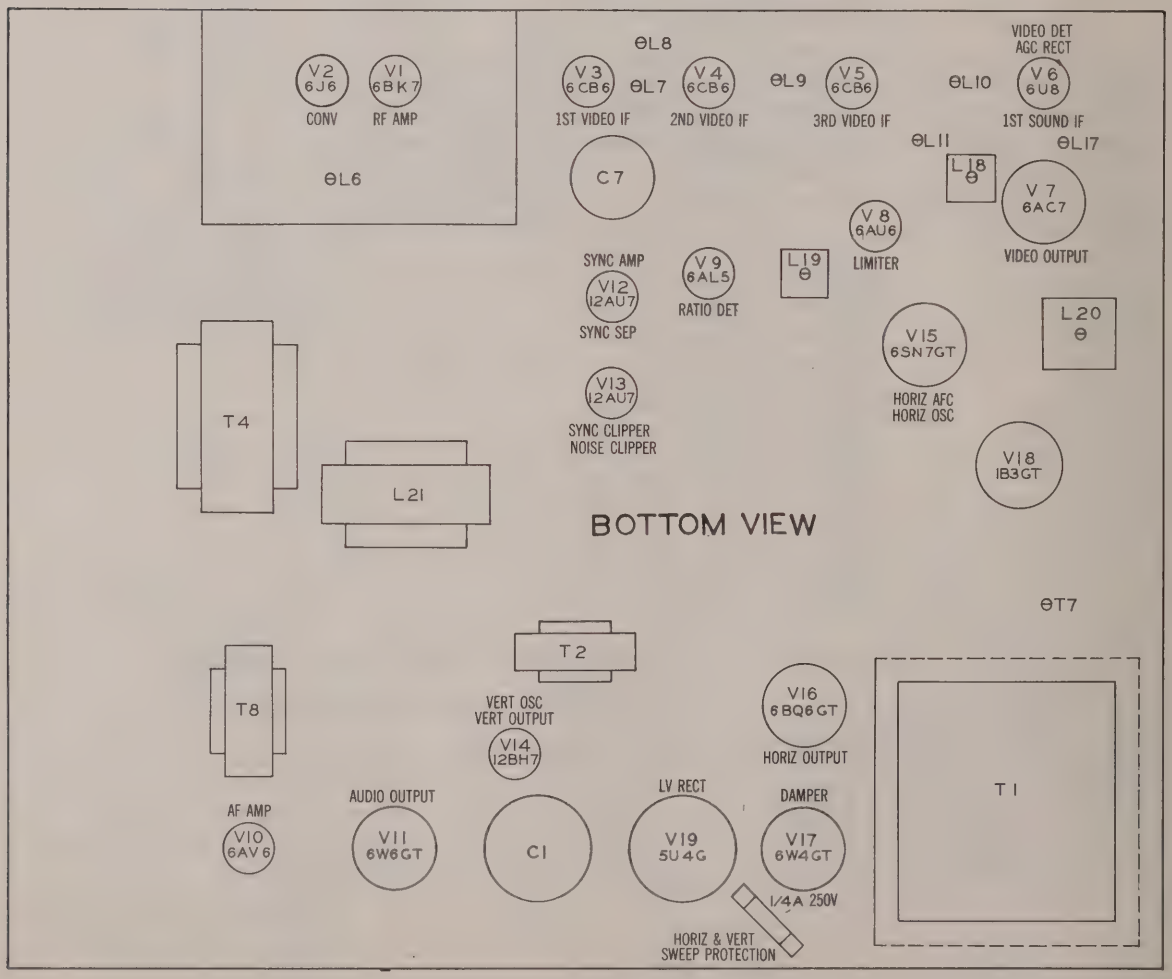
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning gang fully closed and set pointer to coincide with left hand edge of gold rectangle enclosing the dial calibration points.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14.	.1MFD	High side to stator of antenna tuning capacitor.	455KC (400~Mod)	AM	Tuning gang fully open	Across voice coil	A28, A29 A30, A31	Adjust for maximum deflection. Repeat for optimum results.
15.		Loop	1500KC	"	1500KC	"	A32, A33	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust in order given for maximum output. Repeat adjustment for optimum results. (Note: do not adjust trimmer at opposite end of oscillator capacitor from A32).

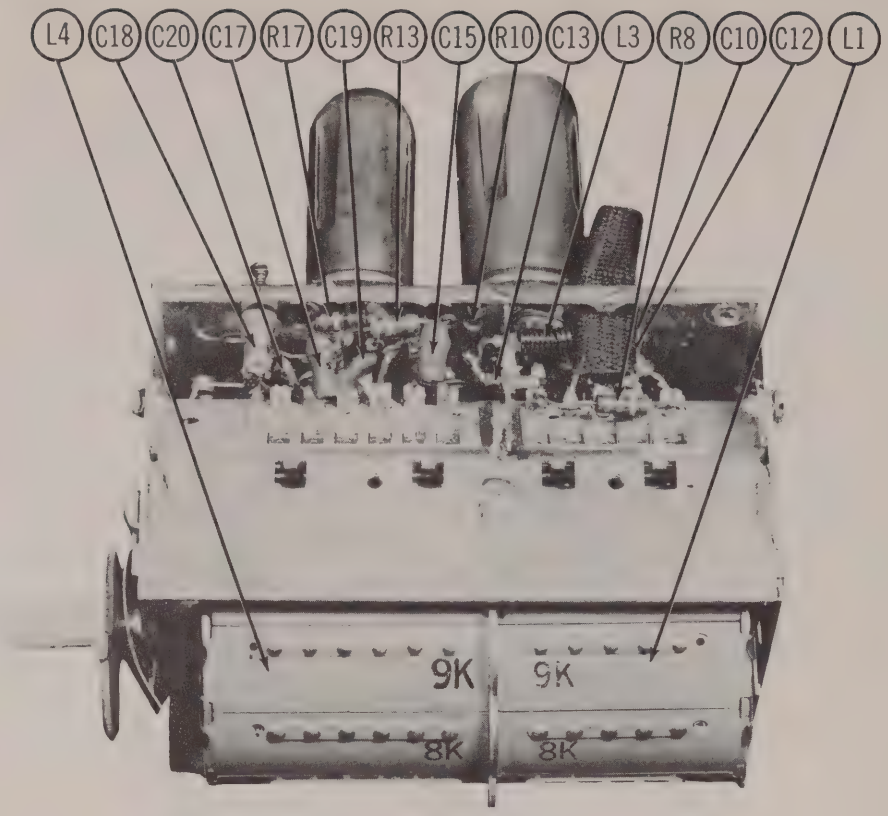
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	1.5Meg	0Ω	.1Ω	0Ω	†6KΩ	†120KΩ	INF	0Ω
V 2	6J6	15KΩ	20KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	775KΩ	47Ω	.1Ω	0Ω	♯330Ω	♯330Ω	0Ω		
V 4	6CB6	775KΩ	47Ω	.1Ω	0Ω	♯330Ω	♯330Ω	0Ω		
V 5	6CB6	.3Ω	150Ω	.1Ω	0Ω	†6.4KΩ	†6.4KΩ	150Ω		
V 6	6U8	340KΩ	100KΩ	♯1KΩ	0Ω	.1Ω	♯1KΩ	47Ω	0Ω	6.1KΩ
V 7	6AC7	0Ω	0Ω	0Ω	900KΩ	100Ω	†73KΩ	.1Ω	†5KΩ	
V 8	6AU6	100KΩ	0Ω	.1Ω	0Ω	♯1KΩ	♯47KΩ	0Ω		
V 9	6AL5	10KΩ	10KΩ	.1Ω	0Ω	1 Meg	0Ω	1 Meg		
V 10	6AV6	10 Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†425KΩ		
V 11	6W6GT	0Ω	0Ω	†680Ω	†450Ω	†160KΩ	†60KΩ	.1Ω	70KΩ	
V 12	12AU7	♯70KΩ	2.2Meg	0Ω	.1Ω	.1Ω	♯47KΩ	0Ω	220KΩ	0Ω
V 13	12AU7	♯8.3KΩ	2.2Meg	2.7KΩ	.1Ω	.1Ω	2.2Meg	2.2Meg	0Ω	0Ω
V 14	12BH7	†2.4Meg	2.2Meg	0Ω	.1Ω	.1Ω	▲2.5KΩ	1.5Meg	1.5KΩ	0Ω
V 15	6SN7GT	1.6Meg	▲80KΩ	410KΩ	480KΩ	▲120KΩ	0Ω	.1Ω	0Ω	
V 16	6BQ6GT	INF	0Ω	INF	†22KΩ	570KΩ	570KΩ	.1Ω	100Ω	Top Cap ▲20Ω
V 17	6W4GT	INF	INF	60KΩ	INF	†484Ω	INF	▲22.5Ω	▲22.6Ω	
V 18	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ▲590Ω
V 19	5U4G	INF	18KΩ	▲25Ω	30Ω	INF	28Ω	▲1KΩ	18KΩ	
V 20	21ZP4A	0Ω	33KΩ	Pin 10 ▲47KΩ	Pin 11 350KΩ	Pin 12 .1Ω				

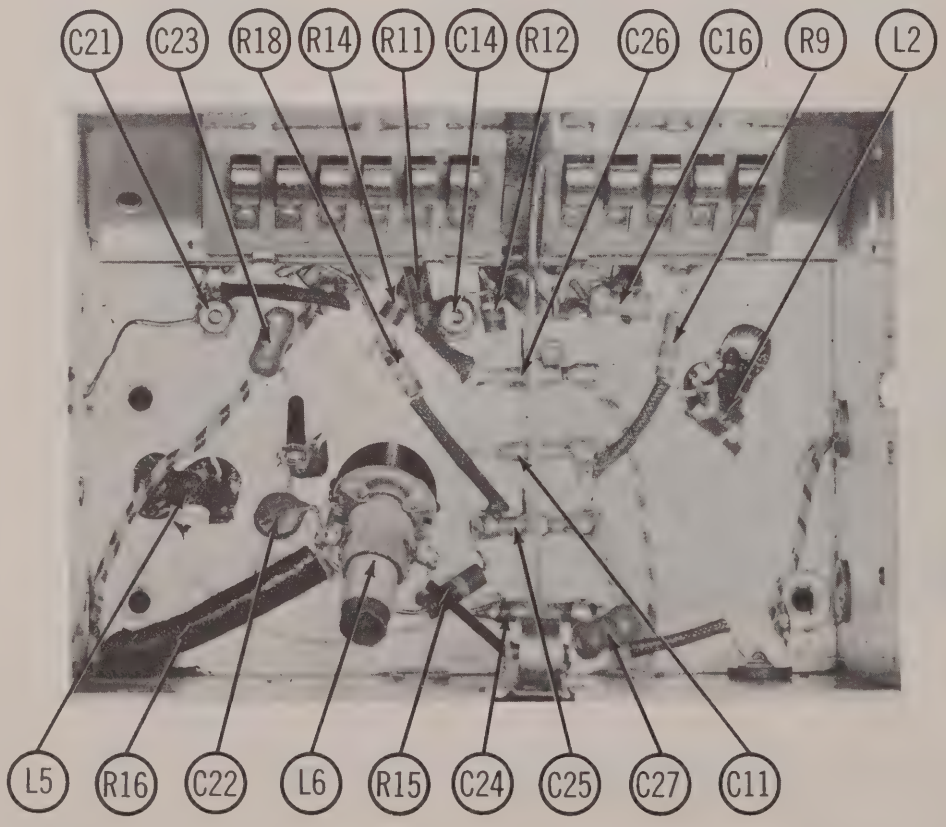
† MEASURED FROM PIN 8 OF V19.
♯ MEASURED FROM 125VDC LINE
▲ MEASURED FROM PIN 3 OF V17.
ALL MEASUREMENTS TAKEN WITH AGC SWITCH IN LOCAL POSITION.



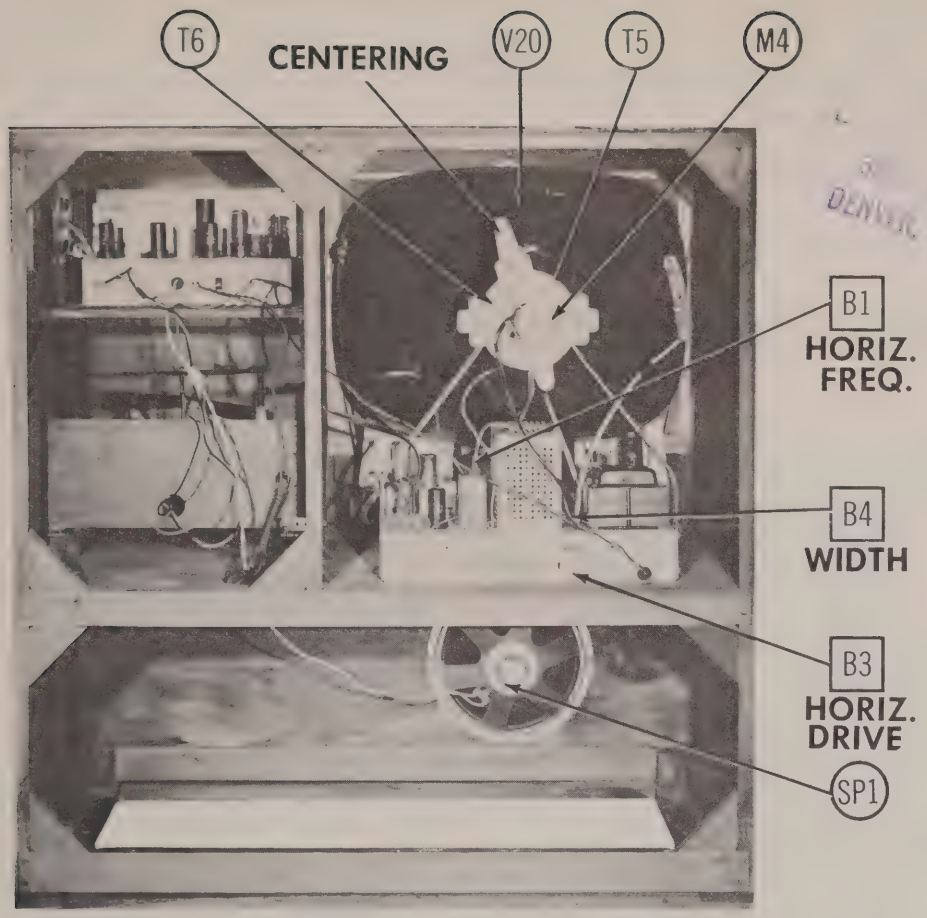
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Connect a short across terminals C and D of horizontal oscillator coil, L20.

Turn the horizontal hold control fully clockwise.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Remove the short from terminals C and D of L20 and connect the vertical amplifier of an oscilloscope through a 5MMF capacitor to terminal C. Connect the ground lead of scope to chassis.

View the waveform on scope and adjust the horizontal phasing slug (B2) for broad and narrow peaks of equal height as in Fig. 7.

If necessary keep the picture in sync by adjusting B1.

Remove the scope and retouch B1 for the following conditions:

Picture should fall out of sync at each extreme of rotation of the horizontal hold control. At full clockwise rotation the blanking bar or jitter of the picture should be evident. At full counter clockwise position picture should lose sync with $4\frac{1}{2}$ to 5 sloping bars in the picture. (If picture holds sync, momentarily interrupt the signal by switching off channel and back).

Adjust the horizontal drive trimmer (B3) counter clockwise as far as possible without the presence of vertical white bars or compression of the center of the picture. If neither indication is noted set B3 two full turns from tight position.

Adjust the width control slug (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.

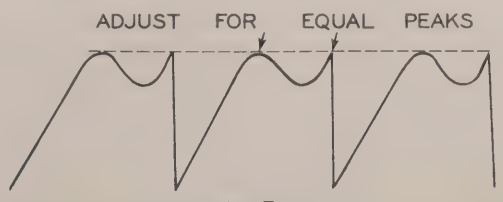


FIG. 7

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "LOSS OF HIGH VOLTAGE".

INSUFFICIENT SWEEP

Check by substitution V15, V16, V17 and V19. Check amplitude of waveform W15;

If Insufficient	If Sufficient
Check all components of horizontal oscillator. Check components of coupling and waveshaping network between V15 and V16. Check B+ circuit.	Check all components of horizontal output stage. Check T3 and T5A. Check components of damper circuit.

DRIVE LINES

Substitute V16. Check drive control and coupling network between V15 and V16.

COMPRESSED AT LEFT SIDE

Substitute V17 and check T5A. Check damper circuit components.

FOLDS

Substitute V16 and V17. Check associated components.

XMAS TREE EFFECT

Substitute V15 and check components, particularly L20, C69, C70, C76 and C77.

VERTICAL

LOSS OF SWEEP

Substitute V14. Check waveform W9;

If Unsatisfactory	If Satisfactory
Check T2, C63, C65, R79, R80, R81 and R83.	Check T4 and T5B. Check C8 and R85.

INSUFFICIENT SWEEP

Follow procedure outlined under "LOSS OF SWEEP".

COMPRESSED AT BOTTOM

Substitute V14. Check C7b, C64, R82 and R83.

COMPRESSED AT TOP

Substitute V14 and check associated components.

FOLDS

Check C64 and R82 for open.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V12, V13 and V15. Check waveform W13;

If Unsatisfactory	If Satisfactory
Check waveform W12.	Check all components of horizontal oscillator, especially L20, C69, C70, C76 and C77.

Check waveform W12;

If Unsatisfactory	If Satisfactory
Check all components of V12 and V13. Check coupling network between V13 and V15.	Check all components of the horizontal AFC circuit.

CRITICAL SYNC

If substituting V12, V13 and V15 fails to correct trouble, follow procedure outlined under "LOSS OF SYNC".

PULLING PICTURE

Substitute V15. Check adjustment of L20 following procedure outlined in alignment section. Check all components of V15.

VERTICAL

LOSS OF SYNC

Check by substitution V12, V13, and V14. Check waveform W7;

If Unsatisfactory	If Satisfactory
Check all components of V12 and V13. Check integrator circuit.	Check all components of V14, especially T2 and C63.

CRITICAL SYNC

If substitution of V12, V13 and V14 does not correct trouble, follow procedure outlined under "LOSS OF SYNC".

TRIGGERING

Dress filament leads away from vertical oscillator grid leads.

VIDEO

LOSS OF VIDEO

Substitute V7 and check associated components. Check picture tube.

SOUND BARS

Check adjustment of All (4.5MC Trap). Check setting of local oscillator and alignment of IF stages.

POOR RESOLUTION

Substitute V7. Check associated components. Check alignment of tuner and video IF stages.

POOR CONTRAST

Check waveform W2;

If Unsatisfactory	If Satisfactory
Substitute V3, V4, V5 and V7. Check associated components.	Check picture tube and components.

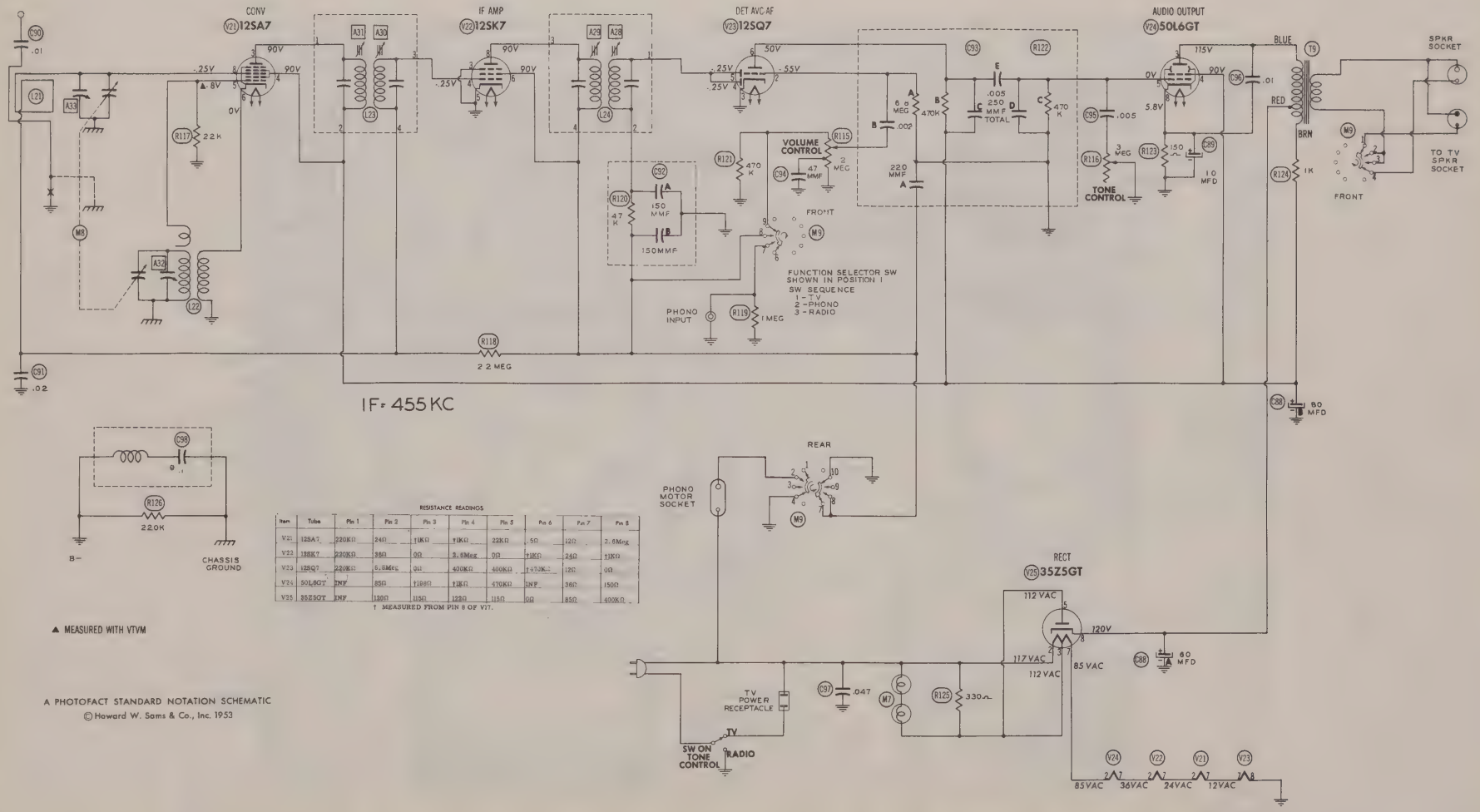
SMEAR

Substitute V7 and check circuit components.

ONE BLACK BAR ACROSS PICTURE ACCOMPANNIED BY PULLING EFFECT

Check tuner, video IF and video amplifier tubes for filament to cathode leakage.

TV CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V21	12SA7	220KΩ	24Ω	1MΩ	1MΩ	22KΩ	.5Ω	12Ω	2.6Meg
V22	12SK7	220KΩ	38Ω	0Ω	2.6Meg	0Ω	1MΩ	24Ω	1MΩ
V23	12SQ7	220KΩ	5.6Meg	0Ω	400KΩ	400KΩ	470KΩ	12Ω	0Ω
V24	50L6GT	INF	85Ω	1100Ω	1MΩ	470KΩ	INF	36Ω	150Ω
V25	35Z5GT	INF	130Ω	115Ω	122Ω	115Ω	0Ω	85Ω	400KΩ

† MEASURED FROM PIN 8 OF V17.

▲ MEASURED WITH VTVM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RADIO SCHEMATIC

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: OLYMPIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6BK7	6BK7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector-AGC Rectifier-1st. Sound IF Amp.	6U8	6U8	9AE	
V7	Video Output	6AC7	6AC7	8N	
V8	Limiter	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6AV6	6AV6	7BT	
V11	Audio Output	6W6GT	6W6GT	7S	
V12	Sync Seperator-Sync Amplifier	12AU7	12AU7	9A	
V13	Sync Clipper - Noise Clipper	12AU7	12AU7	9A	
V14	Vert. Oscillator-Vert. Output	12BH7	12BH7	9A	
V15	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BQ6G T	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: OLYMPIC PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V20	21ZP4A	21ZP4A		12D	① Circuit changes necessary
		21ZP4 ①		12D	
		21YP4 ①		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	450	CO-2758	AFH2-61		BO46		FP447	R1276	
B	▲60	450		PRS450/20		BR4045A				
C2	20	450	CO-2560	PRS450/20		BR2045A		TC75	TVA-1709	
C3	4	450	CO-1056	PRS450/4		BR445		TC70	TVA-1702	
C4	4	450	CO-1056	PRS450/4		BR445		TC70	TVA-1702	
C5	4	50	CO-2756	PRS150/4		BR550		TC30	TVA-1303	
C6	50	350	CO-2344	PRS450/50		BR5035		TC68	TVA-1713	
C7A	■60	200	CO-2759	AFH1-30		A030			R1275	
B	▲125	25		PRS25/100		BR251A				
C8	50	350	CO-2344	PRS450/50		BR5035		TC68	TVA-1713	
C9	4	450	CO-1056	PRS450/4		BR445		TC70	TVA-1702	
C10	3-9				829-10					
C11	800			CN-1-001	MFT-1000				503C-D1	
C12	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C13	800			CN-1-001	MFT-1000				503C-D1	
C14	.5-3				829-3			CT565A		
C15	120				TCN-120		N750L-121			
C16	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C17	100			SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C18	.5-3				829-3			CT565A		
C19	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C20	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C21	.5-3				829-3			CT565A		
C22	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C23	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C24	800			CN-1-001	MFT-1000				503C-D1	
C25	800			CN-1-001	MFT-1000				503C-D1	
C26	800			CN-1-001	MFT-1000				503C-D1	
C27	120				TCN-120		N750L-121			
C28A	1500		CC2D-152K	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C29	2.2		CO-1112	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C30	68									
C31A	1500		CC2D-152K	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C32A	1500		CC2D-152K	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C33	5000		CCD-502X	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	2.2		CO-1112	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C35	47			SI47NP0	TCZ-47		NP0L-470		5TCC-Q47	
C36	4	1500	CO-1915							
C37	100	500	RCM-20A-101M	1468-0001	DC-101	5W5T1	GP2K-101	MC-235	1FM-31	
C38	.22	400	CO-H-4254	P488-22		PTE4P22		PT4025	4TM-P22	
C39	.1	400	CO-H-4104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C40A	1500		CC2D-152K	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C41	.1	400	CO-H-4104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C42	330	500	RCM-20A-331M	1468-00035	D6-331		GP2K-331	UC-5333	1FM-335	
C43	47	500								
C44	.1	400	CO-H-4104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	10	500	RCM-20A-100M	1468-00001	D6-100	5W5Q1	GP1K-100	MC215	1FM-41	
C46	5000		CCD-502X	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C47	47	500	RCM-20A-470M	1468-00005	D6-470	5W5Q5	GP1K-470	MC225	1FM-45	
C48	5000		CCD-502X	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA OLYMPIC PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C49	5000		CCD-502X	BPD-005	MD-502	TMS05	811-006	DC-525	5HK-D5	
C50	330	500	RCM-20A-331M	1468-00035	D6-331		GP3K-331	UC-5333	1FM-335	
C51	.005	600	CO-H-6502	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C52	.01	600	CO-H-6103	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C53	.01	600	CO-H-6K03	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C54	.01	600	CO-H-6103	P688-01	D6-103	PTE6S1	GP3-333-103	PT611	6TM-S1	
C55	.047	400	CO-H-4503	P688-047	DF-503	PTE4S47		PT1417	4TM-S47	
C56	.005	500	CO-H-5502	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C57	220	500	RCM-20A-221M	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-335	
C58	.047	400	CO-H-4503	P688-047	DF-503	PTE4S47		PT1417	4TM-S47	
C59	.047	400	CO-H-4503	P688-047	DF-503	PTE4S47		PT1417	4TM-S47	
C60	.0022	500	CO-H-6202	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C61	.003	600	CO-H-6302	P688-003	D6-202	PTE6D3	GP2-333-302	PT6232	6TM-D3	
C62A, B	.002			P688-002		(PTE6D2		PT622		
C	.005		*PC-2435	P688-005	*PC-100	PTE6D5	*1406-01	PT625	*10IC1	
C	.005			P688-005		PTE6D5		PT625		
C63	.0047	800	CO-O-6472K	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C64	.047	400	CO-H-4503	P688-047	DF-503	PTE4S47		PT1417	4TM-S47	
C65	.22	400	CO-H-4254	P688-22		PTE4P22		PT4025	4TM-P22	
C66	.022	400	CO-H-4203	P688-022	DD-203	PTE4S22		PT1422	4TM-S22	
C67	.02	400	CO-H-4203	P688-02	DD-203	PTE4S2		PT412	4TM-S2	
C68	.047	400	CO-H-4503	P688-047	DF-503	PTE4S47		PT1417	4TM-S47	
C69	47	500	RCM-20C-470K	1469-00005		5R5Q5		MCB225	MS-45	
C70	47	500	RCM-20C-470K	1469-00005		5R5Q5		MCB225	MS-45	
C71	47	500	RCM-20C-470K	1469-00005		5R5Q5		MCB225	MS-45	
C72	.047	400	CO-H-4503	P488-047	DF-503	PTE4S47		PT1417	4TM-S47	
C73	.047	400	CO-H-4503	P488-047	DF-503	PTE4S47		PT1417	4TM-S47	
C74	.02	400	CO-H-4203	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C75	.47	200	CO-H-2474	P288-47		PJ2P5		PT405	2TM-P47	
C76	180	1000	SCM-10C-181K							
C77	.01	600	CO-B-6103	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C78	.001	600	CO-O-6102K	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C79	.001	600	CO-O-6102K	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C80	.01	600	CO-H-6103	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C81	.047	400	CO-H-4503	P488-047	DF-503	PTE4S47		PT1417	4TM-S47	
C82	.22	400	CO-H-4254	P488-22		PTE4P22		PT4025	4TM-P22	
C83	.1	400	CO-H-4104	P488-1		PTE4P1		PT401	4TM-P1	
C84	.1	400	CO-H-4104	P488-1		PTE4P1		PT401	4TM-P1	
C85	56	2000	CCD-560K						20GA-Q56	
C86	.01	600	CO-B-6103	6892X-01		PT611		PT611	6TM-S1	
C87	.01	600	CO-B-6103	6892X-01		PT611		PT611	6TM-S1	

* Items C62A, C62B, C62C, R78A, R78B, R78C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA OLYMPIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	PT-2774	QJ-404*	RTV-196	SBB-853-S	UF152L †	Contrast-Panel
B	1 Meg	2					UR16A †	Volume-Rear
C	Switch						US-26	Attach to R1A
R2A	50KΩ	½	PT-2288	QU-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	5000Ω	½	PT-2271	QU-114	AG-19-S	AB-10	U-14	Vert. Linearity
B	Shaft		Not Req.	RQ	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	1 Meg	½	PT-2269	QU-137	AG-61-S	AB-39	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	2.5Meg	½	PT-2272	QU-239	AG-84-S	AB-43	U-255	Height
B	Shaft		Not Req.	RQ	KSS-3	AK-4	Not Req.	Attach to R5A
R6A	2250Ω	4	PT-2275	4WK-2500	A10-2500		TVF143	Focus-Wire Wound
B	Shaft		Not Req.	Not Req.	KSS-3		Not Req.	Attach to R6A
R7A	500KI.	½	PT-2270	QU-133	AG-58-S	AB-59	U-50	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B17-109 & P1-109 (Panel)
B13-137 & RI-126 (Rear) & SWITCH T6-1.

† UNIVERSAL REPLACEMENT-(MALLORY EXACT DUPLICATE PART NO.UE1958).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA OLYMPIC PART No	IRC PART No.	NOTES
R8	22KΩ	½			
R9	47KΩ	½		BTS-47K	
R10	220KΩ	½			
R11	1000Ω	½		BTS-1000	
R12	680Ω-5%	1			
R13	4700Ω	½		BTS-4700	
R14	220KΩ	½			
R15	33KΩ	½		BTS-15K	
R16	10Ω	½			
R17	10KΩ	½		BTS-10K	
R18	10KΩ	½		BTS-10K	
R19	4700Ω	1		BTA-4700	Note 1
R20	10KΩ	½	REB-103K		
R21	470Ω	½	REB-470M	BTS-47	
R22	330Ω	½	REB-331M	BTS-330	
R23	1000Ω	½	REB-102M	BTS-1000	
R24	1000Ω	½	REB-102M	BTS-1000	
R25	15KΩ	½	REB-153K		
R26	47Ω	½	REB-470M	BTS-47	
R27	33KΩ	½	REB-330M	BTS-330	
R28	10KΩ	½	REB-103K		
R29	150Ω	½	REB-151M	BTS-150	
R30	1000Ω	½	REB-102M	BTS-1000	
R31	8200Ω	½	REB-822K	BTS-8200	
R32	2.2Meg	½	REB-225K	BTS-2.2Meg	
R33	1 Meg	½	REB-105M	BTS-1 Meg	
R34	1 Meg	½	REB-105M	BTS-1 Meg	
R35	1 Meg	½	REB-105M	BTS-1 Meg	
R36	2.2Meg	½	REB-225K	BTS-2.2Meg	
R37	1 Meg	½	REB-105M	BTS-1 Meg	
R38	470KΩ	½	REB-474M	BTS-470K	
R39	560Ω	½	REB-561K	BTS-560	
R40	5600Ω	½	REB-562K	BTS-5600	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA OLYMPIC PART No.	IRC PART No.	NOTES
R41	1.5Meg	½	REB-155K	BTS-1.5Meg	
R42	2.2Meg	½	REB-225K	BTS-2.2Meg	
R43	1000Ω	½	REB-102M	BTS-1000	
R44	33KΩ	½	REB-333M	BTS-33K	
R45	68KΩ	1	REC-683M	BTA-68K	
R46	4700Ω	2	RED-472K	BTB-4700	
R47	220KΩ	½	REB-224M	BTS-220K	
R48	330KΩ	½	REB-334S-A	BTS-330K	
R49	33KΩ	½	REB-333M	BTS-33K	
R50	100KΩ	½	REB-104M		
R51	47Ω	½	REB-470M	BTS-47	
R52	1000Ω	½	REB-102M	BTS-1000	
R53	100KΩ	½	REB-104M		
R54	47KΩ	½	REB-473M		
R55	1000Ω	½	REB-102M	BTS-1000	
R56	150Ω	½	REB-151M	BTS-150	
R57	22KΩ	½	REB-223M	BTS-22K	
R58	10KΩ	½	REB-103K	BTS-10K	
R59	10KΩ	½	REB-103K	BTS-10K	
R60	10Meg	½	REB-106M	BTS-10Meg	
R61	470KΩ	½	REB-474M	BTS-470K	
R62	220KΩ	½	REB-224K	BTS-220K	
R63	100KΩ	½	REB-104M	BTS-100K	
R64	100KΩ	½	REB-104K	BTS-100K	
R65	390Ω	2	RED-391M	BTB-390	
R66	470KΩ	½	REB-474M	BTS-470K	
R67	2.2Meg	½	REB-225K	BTS-2.2Meg	
R68	100KΩ	½	REB-104K	BTS-100K	
R69	47KΩ	½	REB-224K	BTS-47K	
R70	220KΩ	½	REB-224K	BTS-220K	
R71	47KΩ	½	REB-473M	BTS-47K	
R72	2.2Meg	½	REB-225K	BTS-2.2Meg	
R73	2700Ω	½	REB-272K	BTS-2700	

RESISTORS (CONT.)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA OLYMPIC PART No.	IRC PART No.	NOTES
R74	5600Ω	½	REB-562K	BTS-5600	
R75	2700Ω	½	REB-272K	BTS-2700	
R76	2.2Meg	½	REB-225K	BTS-2.2Meg	
R77	47KΩ	½	REB-473M	BTS-47K	
R78A	22KΩ	½		BTS-22K	
B	8200Ω	½	*PC-2435	BTS-8200	
C	∞200Ω	½		BTS-8200	
R79	1.5Meg	½	REB-155K	BTS-1.5Meg	
R80	220KΩ	½	REB-224M	BTS-220K	
R81	470KΩ	½	REB-474M	BTS-470K	
R82	12KΩ	½	REB-123K	BTS-12K	Note 2
R83	1.5Meg	½	REB-155K	BTS-1.5Meg	
R84	560Ω	½	REB-561K	BTS-560	
R85	1000Ω	1	REC-102M	BTA-1000	
R86	33KΩ	1	REC-333M	BTA-33K	
R87	560Ω	½	REB-561K	BTS-560	
R88	560Ω	½	REB-561K	BTS-560	
R89	2700Ω	½	REB-272K	BTS-2700	
R90	150KΩ	½	REB-154K-A	BTS-150K	
R91	68KΩ	1	REC-683K-A	BTA-68K	
R92	180KΩ	½	REB-184K-A	BTS-180K	
R93	330KΩ	½	REB-334K-A	BTS-330K	
R94	820KΩ	1	REC-824K-A	BTA-820K	
R95	82KΩ 5%	1	REC-823J-A	BTA-82K 5%	
R96	330KΩ 5%	1	REC-334J-A	BTA-330K 5%	
R97	390Ω	½	RED-392K	BTS-3900	
R98	150KΩ 5%	1	REC-154J-A	BTA-150K 5%	
R99	8200Ω	½	REB-822K	BTS-8200	
R100	22KΩ	½	REB-223M	BTS-22K	
R101	82KΩ 5%	½	REC-823J-A	BTS-82K 5%	
R102	220KΩ	½	REB-224K	BTS-220K	
R103	47Ω	½	REB-470M		
R104	470KΩ	½	REB-474M	BTS-470K	
R105	100KΩ	½	REB-104M	BTS-100K	Note 3
R106	100Ω	1	REC-101M	BTA-100	
R107	22KΩ	½	RED-223K	BTB-22K	
R108	100KΩ	½	REB-104M	BTS-100K	
R109	47KΩ	½	REB-473M	BTS-47K	
R110	39Ω	2	RED-39M	BTB-390	
R111	5000Ω	10	RE-2995	13/4A-5000	
R112	8200Ω	2	RED-822K	BTB-8200	Note 4
R113	8200Ω	2	RED-822K	BTB-8200	Note 4
R114	100KΩ	1	REC-104M	BTA-100K	

Note 1. Some Models may use a 8200Ω (2 watt) resistor in this application.
Note 2. Some Models may use a 10KΩ resistor in this application.
Note 3. Some Models may use a 150KΩ resistor in this application.
Note 4. Some Models may use a single 18KΩ (2 watt) resistor in this application.
* Items R78A, R78B, R78C, C62A, C62B, C62C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	OLYMPIC PART No.	REPLACEMENT DATA STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No.	RCA TYPE N..
T1	117VAC ⑤1.8A	670VCT ,200ADC	5VAC ⑨3A	6.3VAC ⑨1.2A SEC. 4 6.3VAC ⑨8.3A	TR-2978	P-8185 ②	P-3070	TP-370 ①		

① Remove picture tube mounting bracket for transformer installation.
② Do not use low taps on HV secondary.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC	OLYMPIC PART No.	STANCOR PART No.	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA TYPE No.	NOTES
T2	180Ω	970Ω	TR-1473	A-8125	A-3003	TSO-5	A-97X	208T2 ①	Vert. Osc.Trans.
T3	595Ω tap ③20Ω	25Ω tap ⑥ 2.5Ω, 8Ω, 21Ω SEC. 2 0Ω	TR-2771-1		HVO-9⑦	TFB-13⑧	D-19 ④		Horiz.Output Trans.
T4	1600Ω	5.5Ω	TR-2765	A-8141⑤	A-3039⑤	TSO-12⑤	A-104X ⑤		Vert. Output Trans.
T5A	17Ω		CL-2763	DY-9A ⑩	MDF-10⑩	TY-3 ⑦	Y-17 ⑤		Horiz. Deflection Coils
B	48Ω								Vert. Deflection Coils
T6	420Ω		CL-2979 ⑫	FC-11 ⑥			B-470		Focus Coil
T7	21Ω		CL-2752	WC-5 ⑪ ⑬	MWC-1 ⑪ ⑬	TWL-1	WC-11 ⑪		Width Coil

① Mount on top of chassis.
② Do not connect terminal 7 to terminal 8.
③ Wire as in original circuit.
④ Wire as in original circuit, except, make no connection to terminal "T".
⑤ Connect blue lead to plate and red lead to yellow lead of yoke. Disconnect green lead of yoke from ground and tie to green lead of trans.and connect to point of original boost B+.
⑥ Use original horizontal deflection coil network if necessary.
⑦ Use original deflection coil network.
⑧ Use original focus coil case.
⑨ Enlarge mounting hole.
⑩ Do not use secondary.
⑪ Connect to coded blue and red terminals.
⑫ Includes centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	OLYMPIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T8	2.5KΩ	3.3Ω	220Ω	.54Ω	TR-2766	A-3076	A-2928	RO-2	S-2X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	OLYMPIC PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	10"	PM	3.3Ω	SK-1789-1	10J11	10A31	① Used in some Models.
B	8"	PM	3.3Ω	SK-1906 ①	829	8A21	
C	5"	PM	3.3Ω	SK-1788-1 ①	524	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	OLYMPIC PART No.	MEISSNER PART No	MERIT PART No.	MILLER PART No	NOTES
L1	Ant. Coils	0Ω CT	0Ω					
L2	Fil.Choke	0Ω						
L3	Neutr.Coil	0Ω						
L4	RF,Mixer Grid & Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	1st.Video IF	Hi						
L7	2nd.Vide.IF	.3Ω	.3Ω	CL-2309	17-1063			
L8	Adjacent Channel Sound Trap	0Ω		CL-2973	20-1006		6171A	Olympic part number includes C30
L9	3rd.Video IF	.3Ω	.3Ω	CL-2309	17-1064			
L10	4th.Video IF	.3Ω	.3Ω	CL-2309	17-1063			
L11	Accompany-ing Sound Trap	0Ω		CL-2972	20-1021	TV-112 *	6171 *	Olympic part number includes C35
L12	Series Peak-ing Coil	3.6Ω		CL-1535	19-3036	TV-180	6176	36 Microhenries
L13	Series Peak-ing Coil	5Ω		CL-1536	19-3125		4563	120 Microhenries
L14	Shunt Peak-ing Coil	11.5Ω		CL-2614	19-3500	TV-188	6174	500 Microhenries
L15	Series Peak-ing Coil	6.5Ω		CL-1537	19-3125 †	TV-182	6178	120 Microhenries, wound on 39KΩ resistor
L16	Shunt Peak-ing Coil	8Ω		CL-2973	19-3250	TV-185	6181	250 Microhenries
L17	4.5MC Trap	1.6Ω		CL-2331	20-1004	TV-151	1470	Olympic part number includes C43
L18	Sound IF	1.8Ω	1.8Ω	TR-2977		TV-113	6203	
L19	Ratio Det.	5.5Ω	1.8ΩCT	TR-2630	17-3497	TV-115	6205	Tertiary winding-.65Ω
L20	Horiz.Osc.	75Ω		TR-2990	20-1402	TV-162	6183	Pri. tapped@ 53Ω, Horiz. waveform winding -48Ω

* Enlarge mounting hole.
† Parallel with 39KΩ resistor

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	OLYMPIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L21	.200ADC	64Ω	2 Hy.	CK-1346	C-2325 ①	C-2991 ①	TR-4200 ①	C-17X

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	OLYMPIC PART No. FUSE	OLYMPIC PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG P/T	1/4A ④ 250V.	FU-1683		318,250		GJV 1/4	

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M2	RF Tuner	CL-2755-1	
M3	Switch		Local-Distance
M4	Ion Trap	PP-2248	
B3	Trimmer Cap.	CT-2757	50-370MMF, Horiz. Drive
	Cabinet	CA-2918	Model 21T58
	Cabinet	CA-2928	Model 21K61, 21K62
	Cabinet	CA-2930	Model 21K63B
	Cabinet	CA-3022	Model 21C65
	Cabinet	CA-3034	Model 21T69
	Cabinet	CA-3023	Models 21C72, 21C73
	Cabinet	CA-3033-2	Model 21T74
	Cabinet	CA-2926	Model 21D60
	Cabinet	CA-2934	Model 21D64
	Cabinet	CA-2920	Model 21C68
	Cabinet	CA-3033-1	Model 21T70
	Cabinet Back	ST-2942	Model 21D60
	Cabinet Back	ST-2944	Models 21T58, 21T69, 21T70 and 21T74
	Cabinet Back	ST-2945	Models 21C65, 21C68
	Cabinet Back	ST-2946	Model 21D64
	Cabinet Back	ST-2947	Models 21K61, 21K62 and 21K63
	Mask	PP-2940	All 21 inch Models
	Safety Glass	PP-2938	All 21 inch Models
	Knob	KN-2296	(Mahogany) Fine Tuning
	Knob	KN-2295-1	(Mahogany) Channel Selector (with gold fill in)
	Knob	KN-2297-1	(Mahogany) Volume Control (with gold fill in)
	Knob	KN-2298	(Mahogany) Contrast
	Knob	KN-2545	(Tan) Channel Selector
	Knob	KN-2546	(Tan) Fine Tuning
	Knob	KN-2547	(Tan) Volume
	Knob	KN-2548	(Tan) Contrast
	Escutcheon	MP-2970	Moulded 21 inch Models only

OLYMPIC MODELS 21C65, 21C68, 21C72, 21C73, 21D60, 21D64, 21K61, 21K62, 21K63B, 21T58, 21T69, 21T70, 21T74 (Ch. TN)

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		OLYMPIC PART No.	STANDARD REPLACEMENT		
V21	AM Converter	12SA7	12SA7	8R	
V22	AM IF Amplifier	12SK7	12SK7	8N	
V23	Det.-AVC-AFAmp.	12SQ7	12SQ7	8Q	
V24	Audio Output	50L6GT	50L6GT	7S	
V25	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C88A	■60	150	CO-2820	AFH3-13		BO18		FP216	TVL-2438	
B	▲80	150				BR2015A		TC45	TVA-1410	
C89	10	25	CO-1133	PRS25/10		BR102A		TC22	TVA-1204	
C90	.01	600	CO-H-6103	P688-01		PTE6S1		PT611	6TM-S1	
C91	.02	600	CO-H-6203	P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C92A	150		*PC-2478	SI150	*PC-51	TM5T15	*1403-02	UC-5315	*100C2	
B	150			SI150		TM5T15		UC-5315		
C93A	220									
B	.002									
C	250		†PC-2477		†PC-150		†1408-01		†103C4	
D										
E	.005									
C94	47	500	RCM20A470M	1468-00005	D6-470	5W5Q5	GP1K-470	MC225	1FM-45	
C95	.005	600	CO-H-6502	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C96	.01	600	CO-H-6103	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C97	.047	400	CO-B-4503	489ZX-05		PJ4S5		PT4147	4TM-S47	
C98	.1	400	CO-H-4104	P488-1		PTE4P1		PT401	4TM-P1	Note 1

Note 1. When replacing this item, rewind 12 turns #20 insulated wire on cap.
* Items C92A, C92B, R120 are combined in one unit.
† Items C93A, C93B, C93C, C93D, C93E, R122A, R122B, R122C are combined in one unit. When replacing items separately C93C and C93D should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R115A	2 Meg	½	PT-567	Q13-139X	AT-115	ABT-80	UT-449	Volume Tap ⓐ 700KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R115A
R116A	3 Meg	½	PT-2160		AG-67-Z	AB-85	U-57	Tone
B	Shaft		Not Req.		KSS-3	AK-4	Not Req.	Attach to R116A
C	Switch		Not Req.		SWB-1	KB-3	US-28	Attach to R116A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R117	22KΩ	½	REB-223M	BTS-22K	
R118	2.2Meg	½	REB-225M	BTS-2.2Meg	
R119	1Meg	½	REB-105M	BTS-1Meg	
R120	47KΩ	½	*PC-2478	BTS-47K	
R121	470KΩ	½	REB-474M	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R122A	6.8Meg	½	†PC-2477	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R123	150Ω	½	REB-151K	BTS-150	
R124	1000Ω	2	RED-102M	BTB-1000	
R125	330Ω	1	REC-331K	BTA-330	
R126	220KΩ	½	REB-224M	BTS-220K	

* Items R120, C92A, C92B, are combined in one unit.
† Items R122A, R122B, R122C, C93A, C93B, C93C, C93D, C93E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		OLYMPIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T9	2.4KΩ	3.3Ω	206Ω tap ⓐ 8Ω	.66Ω	TR-2690-1	A-3330 ①	A-3031 ①	RO-3 ①		① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L22	Loop Ant.	.05Ω	1.6Ω	LP-2687				
L23	Osc.Coil	.5Ω	6.5Ω	CL-2709	14-1073			
L24	Input IF	15Ω	15Ω	TR-1644	16-6758	BC-352	12-C1	
L25	Output IF	15Ω	15Ω	TR-1644	16-6758	BC-353	12-C2	

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	OLYMPIC PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M5		ACD-J	A-1 A-3	W22A	A65MG A61A	96-T	0-1 or S-1 & 0-3 or S-3	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THEIR RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

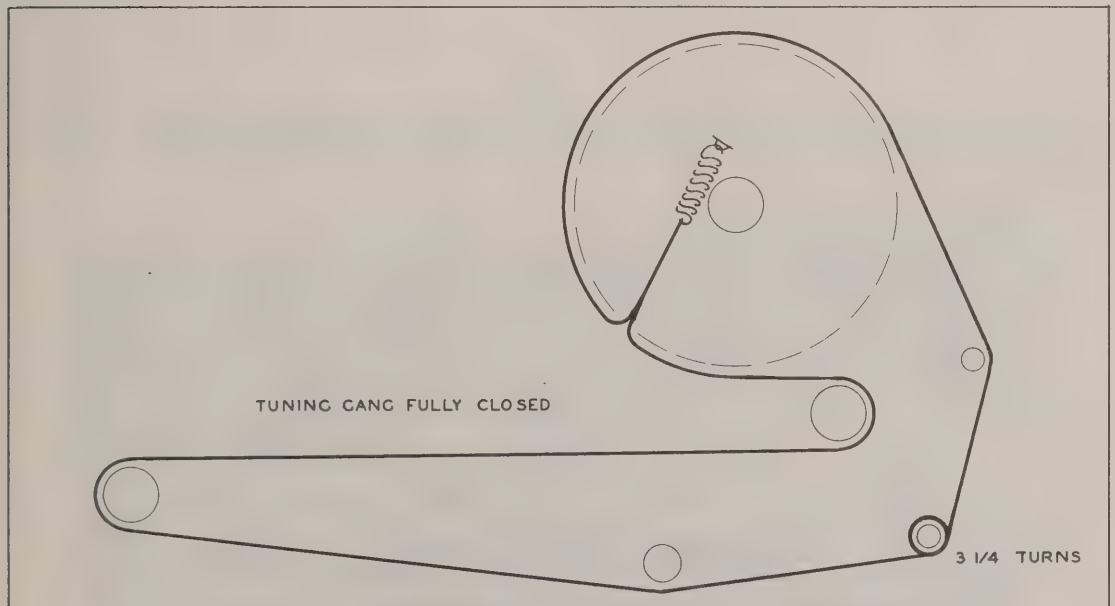
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

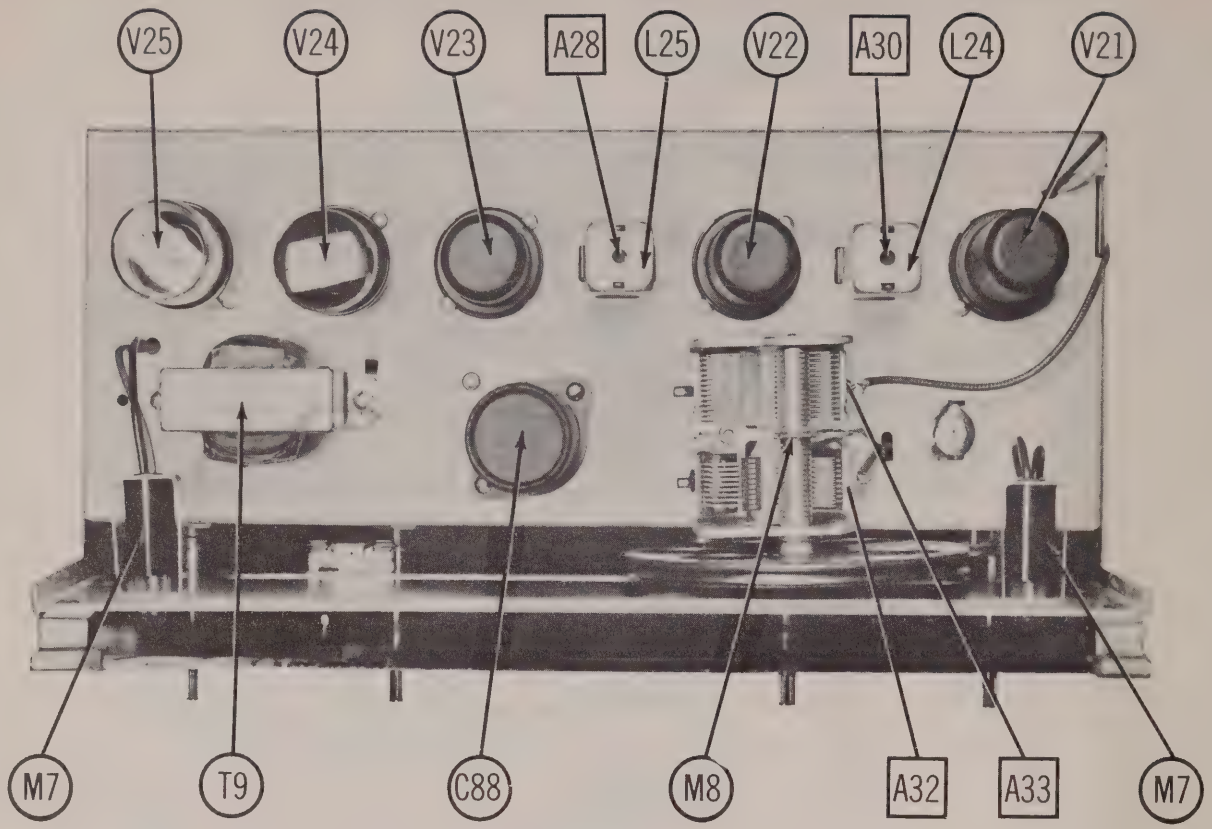
ITEM No.	REPLACEMENT DATA			REMARKS
	OLYMPIC PART No.	WALCO PART No.	JENSEN PART No.	
M6		W-5MGS or W-5MGA & W-5S or W-5A	A-75LP or A-85LP & A-75 or A-85	

MISCELLANEOUS

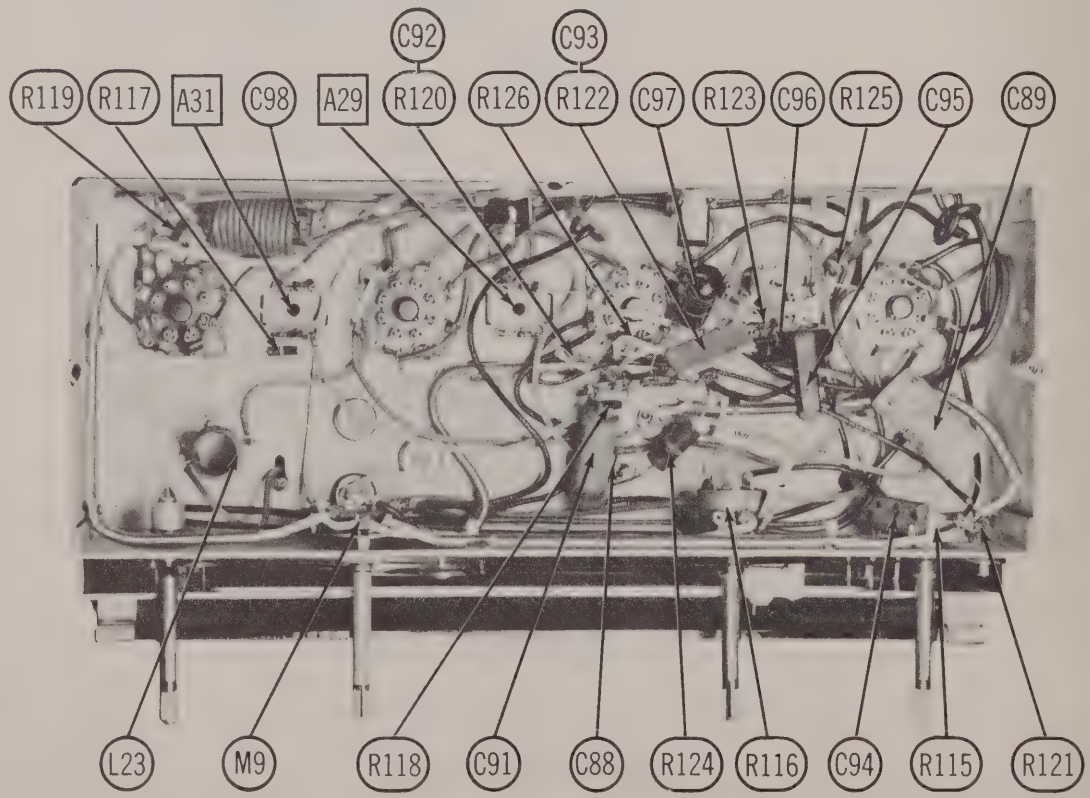
ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M7	Dial Light	BU-2688	Type #1490
M8	Tuning Capacitor	CU-2681	
M9	Switch	SW-2689	AM, Phono, TV- (Function Selector)
	Back (Radio)	ST-2988	Model 21K61
	Back (Radio)	ST-2994	Models 21K62, 21K63B
	Escutcheon (radio)	ES-2967	Models 21K61, 21K62 and 21K63B
	Dial Scale	DL-2682	Glass
	Pointer (Dial)	P0-1011	
	Knob	KN-422	(Walnut) Volume
	Knob	KN-423	(Walnut) Off/On Tone
	Knob	KN-425	(Walnut) Tuning
	Knob	KN-268-1	(Walnut) Function Selector



DIAL CORD DRIVE



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW

TROUBLE SHOOTING AIDS (CONT.)

AUDIO

WEAK OR NO SOUND

Check by substitution V6, V8, V9, V10 and V11. Check adjustment of discriminator. Check all components in sound system , especially, the speaker, T6 and the coupling capacitor C45.

BUZZ

Substitute V9. Check adjustment of discriminator secondary. Check setting of local oscillator. Check for overload at waveform W1. If overload exists, check AGC Circuit.

DISTORTED

Check by substitution V6, V8, V9, V10, and V11. Check audio stages using audio signal generator and scope;

If Undistorted	If Distorted
Check adjustment of sound discriminator. Check components of V6B, V8, and V9.	Check components of stage where distortion occurs.

PROPERTY OF L. F. [illegible] OWNERSHIP [illegible] DENVER, COLORADO

POWER

SET DEAD

Substitute V19. Check all B+ components including T1 and the interlock.

SMALL RASTER

Substitute V19. Check "LINE VOLTAGE". Check B+ filters. Check boost B+.

DIM PICTURE

Follow procedure outlined under "SMALL RASTER" and "LOSS OF HIGH VOLTAGE". Check picture tube for low emission.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution ,V15, V16, V17 and V18. Check 1/4 Amp. fuse located under the chassis. Check waveform W15;

If Unsatisfactory	If Satisfactory
Check all components of V15 and coupling network between V15 and V16.	Check all components of V16, V17 and V18, especially T3 and T5A.

INSUFFICIENT HIGH VOLTAGE

Follow procedure outlined under "LOSS OF HIGH VOLTAGE".

BLOOMING

Follow procedure outlined under" LOSS OF HIGH VOLTAGE " and "SMALL RASTER".

GENERAL

RASTER BUT NO SOUND OR PICTURE

Check by substitution V2 , V3, V4 and V6. Check tuner and video IF components.

WEAK PICTURE AND WEAK SOUND

Check tuner and video IF tubes and components. Check V11 particularly, as it acts as voltage divider for the video IF and sync tubes.

VERY SNOWY PICTURE

Check V1 and associated components. Check alignment.

SOUND BUT NO PICTURE

Check V7 and associated components. Check picture tube.

INTERMITTENT STREAKS

Check high voltage circuit for corona arcing and discharge.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustment are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

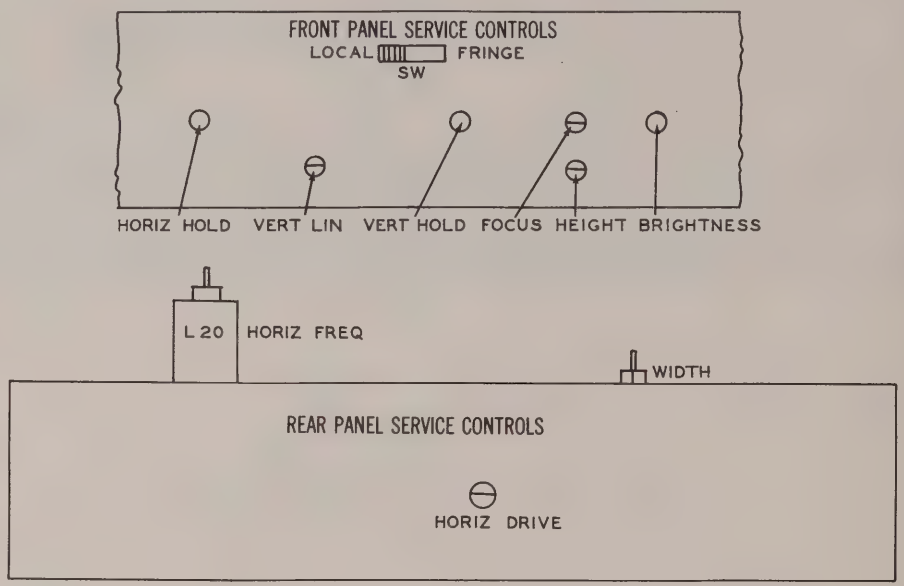
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 3 wood screws holding wood strip at top of cabinet. Remove wood strip and safety glass by tilting forward and lifting out. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENTS LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug,(L20) until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF detector buzz, adjust the ratio detector secondary (L19) located on top of chassis. (See tube placement chart).

FUSES

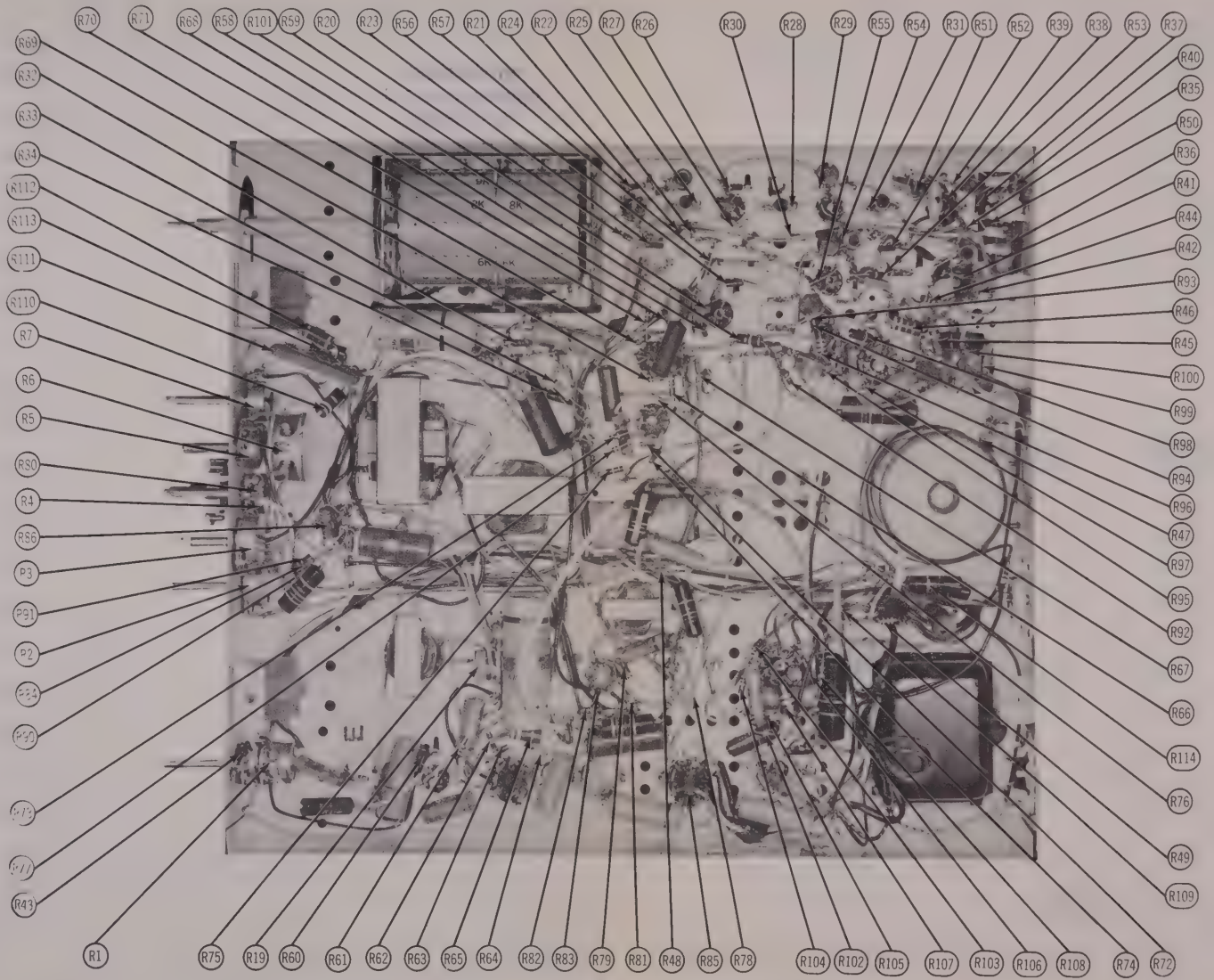
One fuse is used for horizontal sweep protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the EM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

TV		RADIO
1. Remove 4 push on type control knobs from front panel.		1. Remove 4 push on type control knobs from front panel.
2. Remove 2 wood and 2 metal screws. Remove rear cover. Note: TV AC plug goes to rear of radio chassis.		2. Remove 5 wood screws. Remove rear cover.
3. Disconnect speaker plug and built-in antenna.		3. Disconnect speaker, phono AC plug, phono audio plug and phono grd lead.
4. Remove 4 chassis bolts. Remove TV chassis.		4. Remove 3 chassis bolts. Remove radio chassis.
		5. Remove speaker nuts. Remove speaker.



TV CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHILCO
MODEL 53-1754

PHILCO
MODEL 53-1754

TRADE NAME	Philco Model 53-1754
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated AM Two-Band Superheterodyne Receiver
TUBES (Six)	Types 6BJ6 RF Amp., 6BE6 Conv.-Phono Preamp., 6BJ6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	105-120 Volts AC
RATING	.61 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620 KC
SPECIAL SERVICES	1700KC-3400KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400%Mod)	Broad-cast	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust in order given for maximum output.
2.		Loop	1620KC	"	1620KC (See remarks)	"	A5	Fully open tuning gang, place a 6 mil flat shim beneath heel of rotor and close gang until it holds shim in place. Remove shim without disturbing setting of gang. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1520 KC	"	Tune to 1520KC signal	"	A6, A7	Adjust for maximum output.
4.		"	580KC	"	Tune to 580KC signal	"	A8	Adjust for maximum output. Repeat steps 3 and 4 until no further improvement is noted.
5.		"	3200KC	Special Services	Tune to 3200KC signal	"	A9, A10	Adjust for maximum output.
6.		"	1800KC	"	Tune to 1800KC signal	"	All	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Conv-Phono Pre. Amp.	6BE6	6BE6	7CH	
V3	IF Amplifier	6BJ6	6BJ6	7CM	
V4	Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

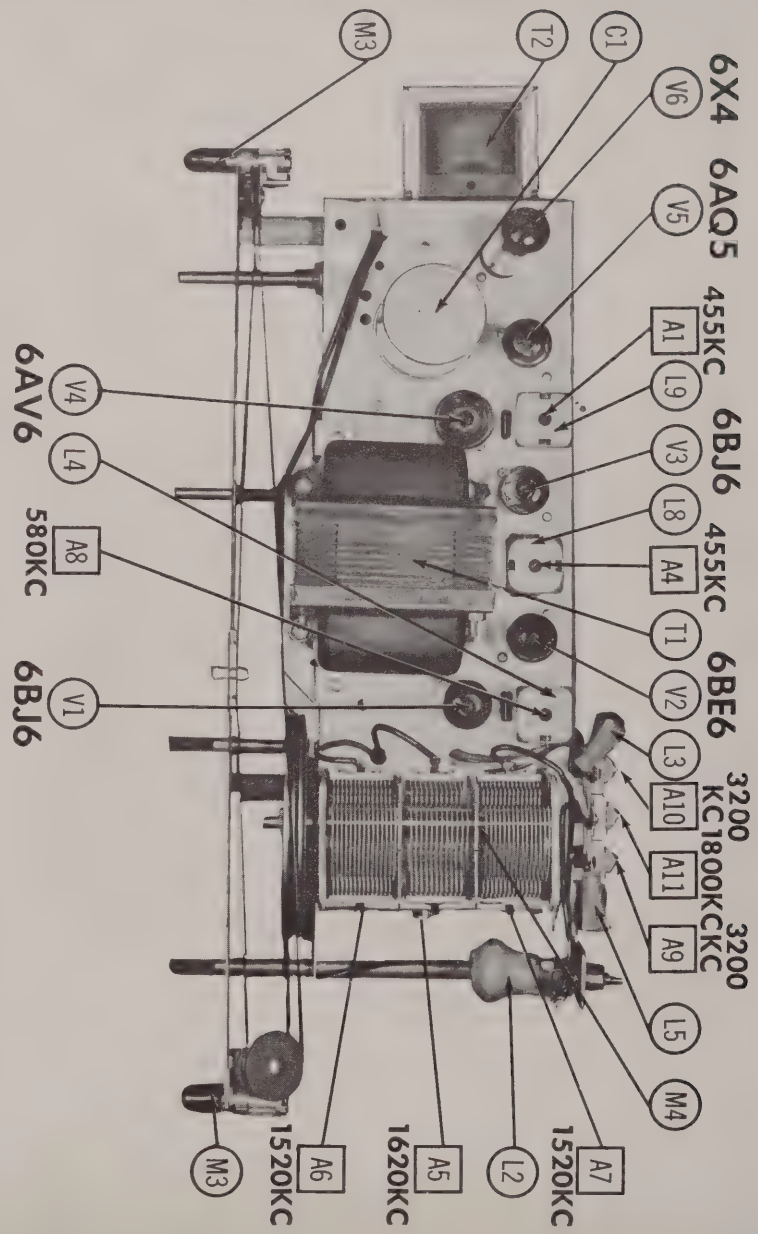
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▬40	350	30-2584-32	AFH4-18					R1375	
B	■20	350								
C	▲20	350								
D	10	350								
C2	100		62-110001001	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C3	.047	400	30-4650-45	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	Note 1
C4	.047	400	30-4650-45	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	Note 1
C5	5	500	60-90505020	1469-000005		5R5V5		MCB205	MS-55	
C6	865	500								Note 2
C7	100		62-110001001	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	Note 1
C8	.047	200	30-4650-45	P288-047	DF-503	PTE4S47		PT4147	4TM-S47	
C9	47		60-00475417	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C10	7.5		30-1224-65							
C11	5000		30-1238-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C12	47		60-00475417	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	Note 1
C13	220		62-122001001	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C14	10000		30-1238-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C15	.047	200	30-4650-45	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C16	.0068	600	30-4650-57	P688-0068	D6-682	PTE6D68			6TM-D68	
C17	47		60-00475417	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C18	5000		30-1238-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C19	10000		30-1238-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C20	5000		30-1238-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C21A	7000	}	30-1239-4	{ 1467-007		{ 1D3D7		{ MC469		
B	220			{ SI220		{ 5W5T25		{ UC-5322		
C22	.0033	1000	30-4650-89	P1088-0033		PTE16D33		PT16233	MB-D33	
C23	.0068	600	30-4650-57						6TM-D68	Note 3
C24	.01	600	30-1238-2	689ZX-01		PJ6S1		PT611	6TM-S1	Note 1
C25	220		62-122001001	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	Note 1
C26	100		62-110001001	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	Note 1

Note 1. Not used in all Models.
Note 2. Some Models use 944MMF in this application (part #30-1220-65).
Note 3. Some Models use .01MFD in this application (part #30-1238-2).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	2 Meg	½	33-5535-36	Q18-139X		BT-82	UT-451	Volume Tap@ 800KΩ
R2A	8 Meg		33-5566-48	Q11-141	AG-85-S	B-89-S	U-67	Tone
B	Shaft		Not Req.	FS-3	FS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	SWB	SWB	Not Req.	Not Req.	Attach to R2A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R3	1 Meg	½	66-5108340	BTS-1 Meg	
R4	82Ω	½	66-0828340	BTS-82	
R5	22KΩ	2	66-3225340	BTB-22K	
R6	1 Meg	½	66-5108340	BTS-1 Meg	
R7	27KΩ	½	66-3278340	BTS-27K	
R8	33KΩ	½	66-3338340	BTS-33K	
R9	220KΩ	½	66-4228340	BTS-220K	
R10	1 Meg	½	66-5108340	BTS-1 Meg	
R11	470KΩ	½	66-4478340	BTS-470K	
R12	270Ω	½	66-1278340	BTS-270	
R13	68KΩ	½	66-3688340	BTS-68K	
R14	10KΩ	½	66-3108340	BTS-10K	
R15	2.2Meg	½	66-5228340	BTS-2.2Meg	
R16	330KΩ	½	66-4338340	BTS-330K	
R17	47KΩ	½	66-3478340	BTS-47K	
R18	470KΩ	½	66-4478340	BTS-470K	Note 1
R19	47KΩ	½	66-3478340	BTS-47K	
R20	10Meg	½	66-6108340	BTS-10Meg	
R21	1 Meg	½	66-5108340	BTS-1 Meg	Note 2
R22	470KΩ	½	66-4478340	BTS-470K	
R23	330Ω	1	66-1334340	BTA-330	
R24	270Ω	2	66-1275340		
R25	1000Ω	2	66-2105340	BTB-1000	

Note 1. Not used in all models.
Note 2. Some models may use a 220KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117 VAC ② .61A	566VCT .074A	6.3VAC ②2.7A		32-8610			PV-70A ①	

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.3KΩ	3.2Ω	410Ω	.7Ω	32-8242-13	A-3823	A-3019	RO-303	S-53X	

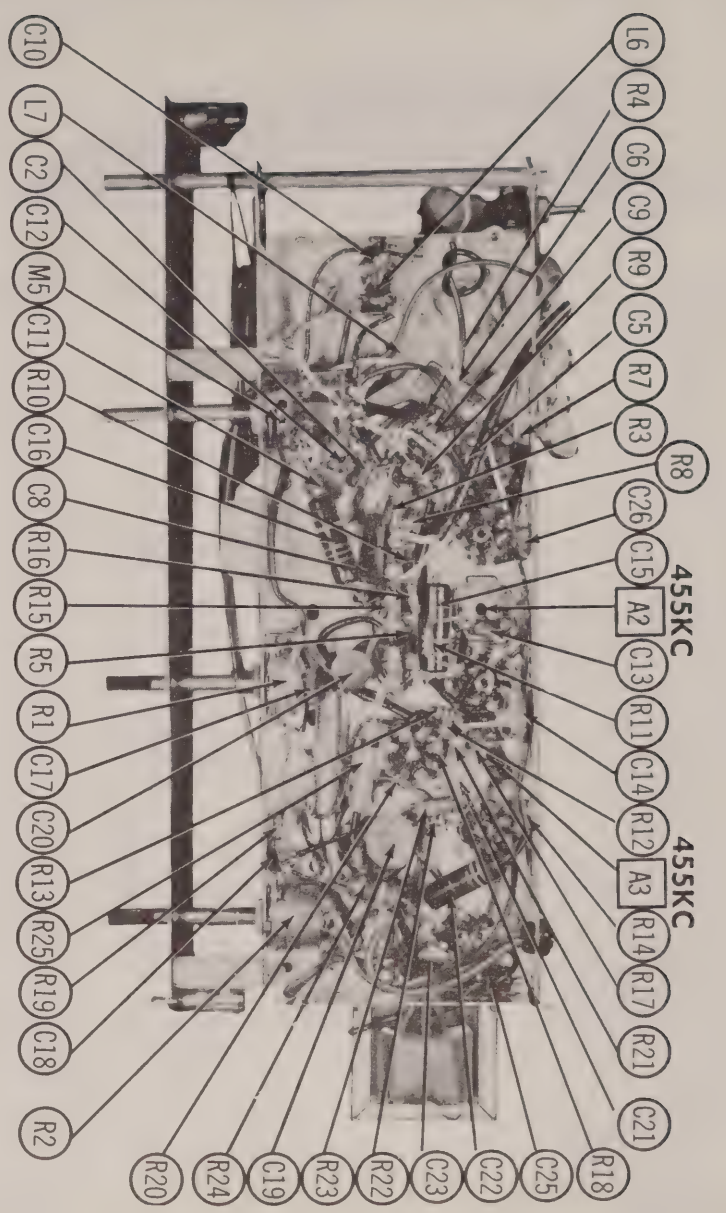
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	VIKING PART No.	QUAM PART No.	
SP1	10 "	PM	3.2Ω	36-1610-6	10J11	10A4A	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	BC Loop Ant.	0Ω		32-4394-13				
L2	BC Ant.Coil	3.2Ω		32-4413-2				Tapped ② .5Ω
L3	SS Ant. Coil	1.8Ω		32-4561-5				
L4	BC RF Coil	95Ω	4.5Ω	32-4399-7A				Includes Capacitor
L5	SS RF Coil	1.8Ω		32-4561-5				
L6	BC Osc.Coil	1.5Ω	6.5Ω	32-4453-2			71-Osc.	
L7	SS Osc.Coil	2.9Ω		32-4562-1				
L8	Input IF	12Ω	12Ω	32-4160A	16-6758	BC-352	12-C1	
L9	Output IF	15Ω	15Ω	32-4240A	16-6770	BC-355	12-C6	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	PHILCO PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	45-9612							

PHONO NEEDLE

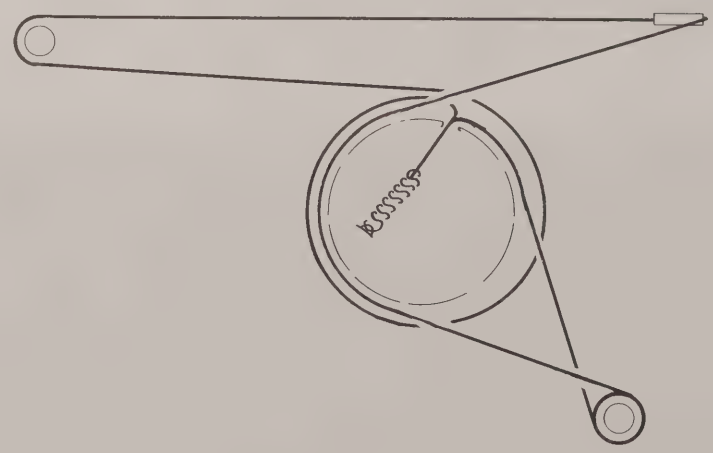
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHILCO PART No.	WALCO PART No.	JENSEN PART No.	
M2	45-9588	W-46TPS	PH-12 or PH-13	

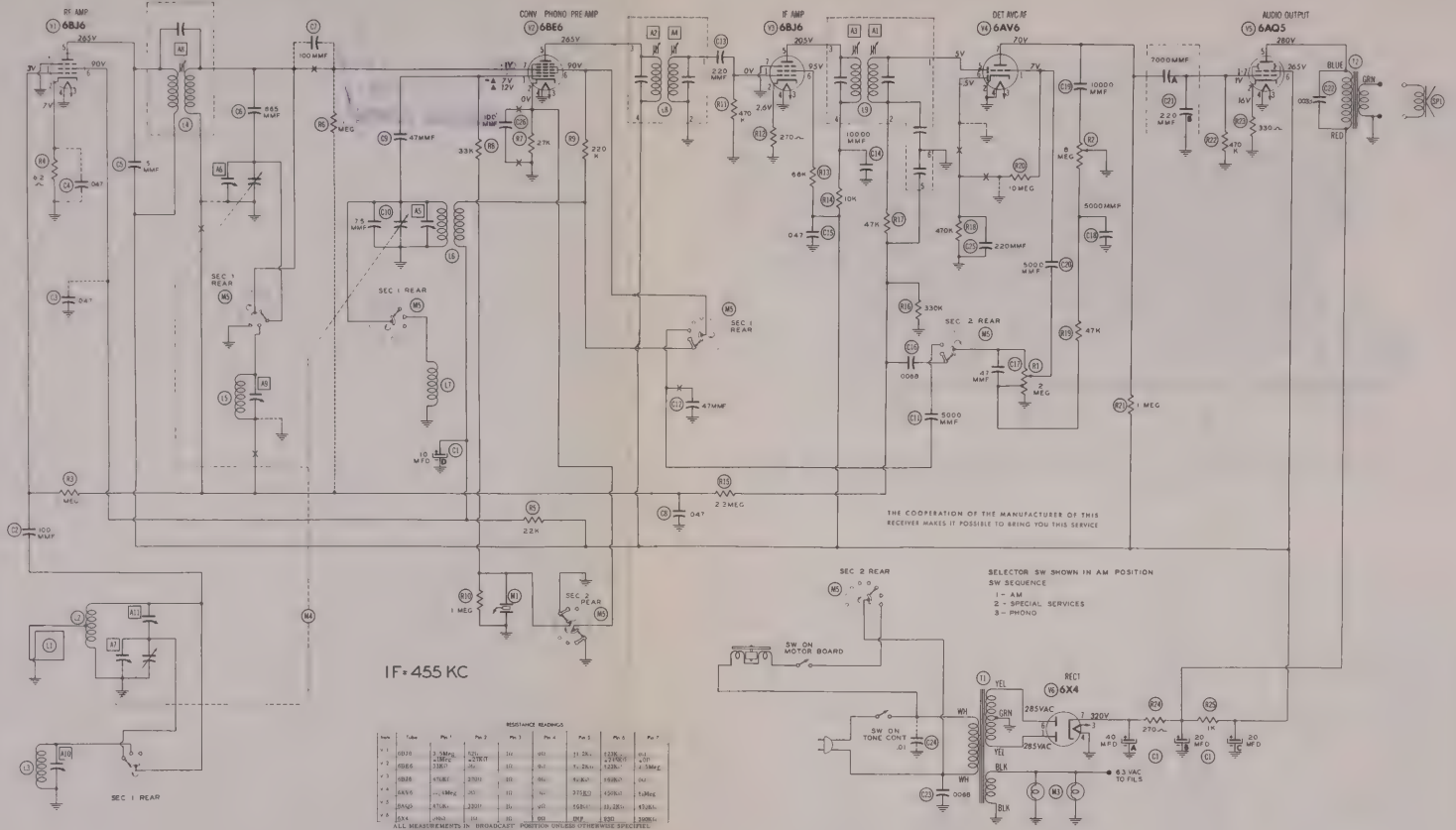
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Dial Light	27-6233-4	Type 4 (2 Used)
M4	Tuning Capacitor	31-2771-3	28-477MMF, 29-477MMF, 14-160MMF
M5	Switch	42-1997	Broadcast-Special Services-Phono Selector
	Trimmer Capacitor Assembly	31-6477-17	Antenna Padder, Antenna Trimmer, RF Trimmer (Special Services) (3 Units)
	Cabinet	10985	
	Back	54-9832	
	Dial Backplate Assembly	76-8321	
	Scale	54-5184	
	Pointer	56-5630-57	
	Knob	54-4718-20	Off/On Tone, Volume, Tuning (3 Used)
	Knob	54-4718-21	Function Selector

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
* 1	6BJ6	2.5Meg	62Ω	2Ω	0Ω	11.2K	122K	0Ω
		2.8Meg	250KΩ				250KΩ	2.5Meg
* 2	6BE6	330KΩ	0Ω	1Ω	0Ω	5.2K	122K	2.5Meg
* 3	6BJ6	470KΩ	250Ω	2Ω	0Ω	60KΩ	180KΩ	0Ω
* 4	6AV6	2.5Meg	0Ω	1Ω	0Ω	375KΩ	450KΩ	2.5Meg
* 5	6AQ5	470KΩ	220Ω	2Ω	0Ω	150KΩ	11.2K	470KΩ
* 6	6X4	0Ω	0Ω	0Ω	0Ω	0Ω	0Ω	330KΩ

ALL MEASUREMENTS IN BROADCAST POSITION UNLESS OTHERWISE SPECIFIED.
* MEASURED IN PHONO POSITION
† MEASURED FROM PIN 7 OF V4
‡ TAKEN WITH VACUUM TUBE VOLTMETER

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PHOTOFACT* Folder

WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2)

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MODEL H-736T17

WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2)

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DATE 9-53 SET 214 FOLDER 10

PHOTOFACT* Folder

*TRADE MARK

WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2)

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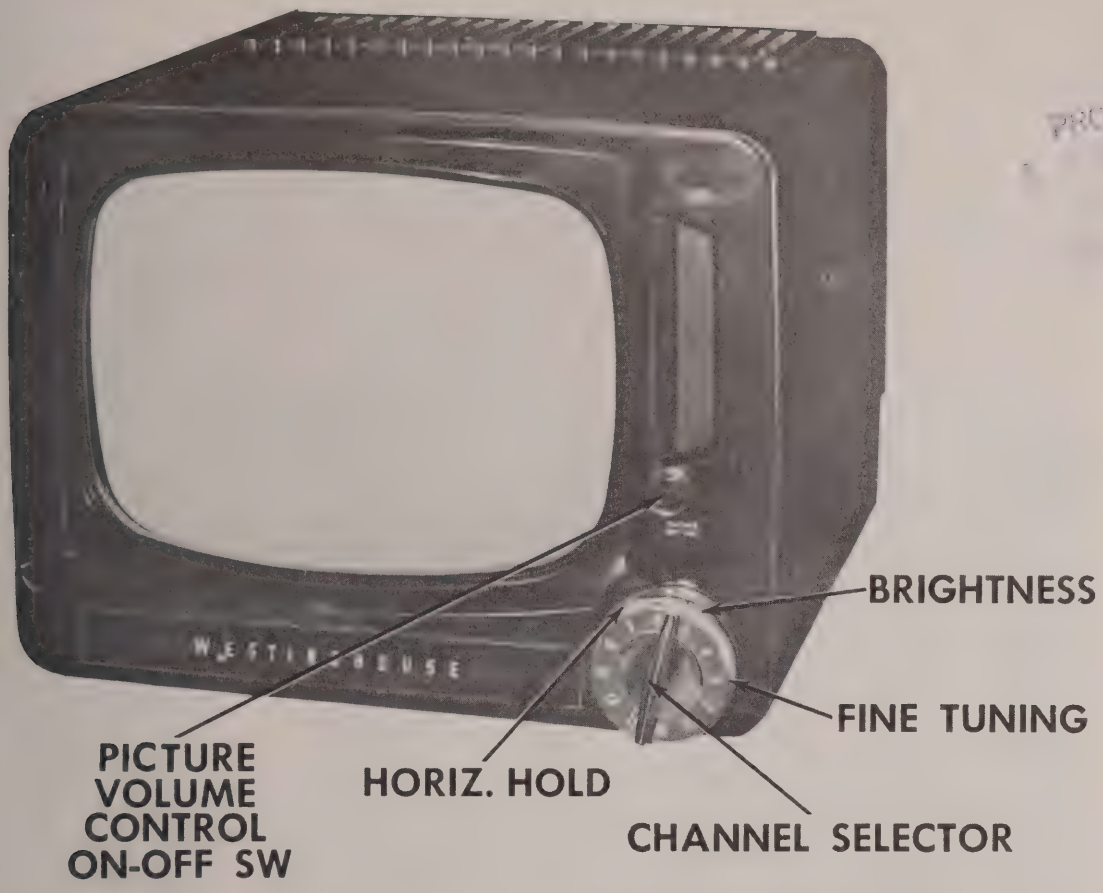

WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2)

WESTINGHOUSE MODEL H-736T17

TRADE NAME	Westinghouse Models H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2)
MANUFACTURER	Westinghouse Electric Corp., Television - Radio Div., Sunbury, Pa.
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.76 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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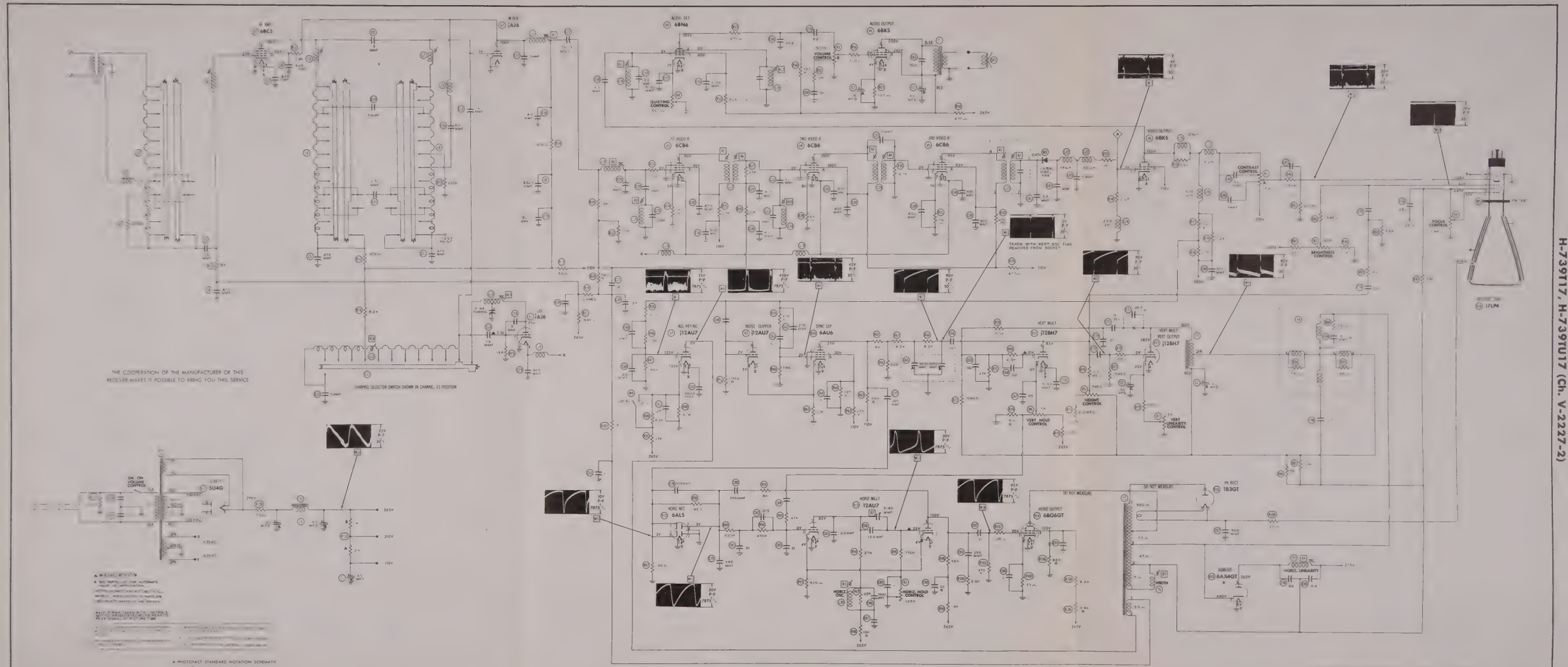
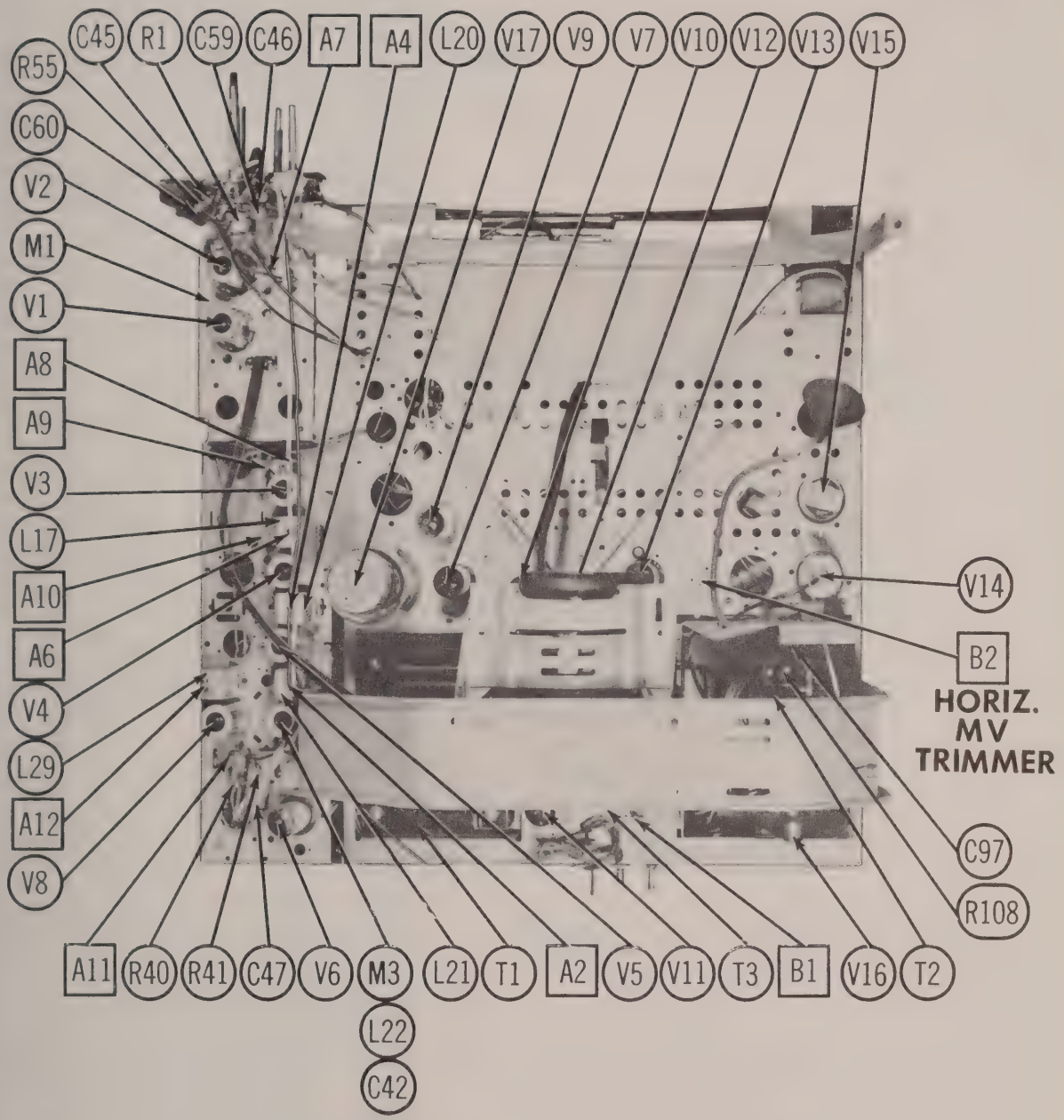
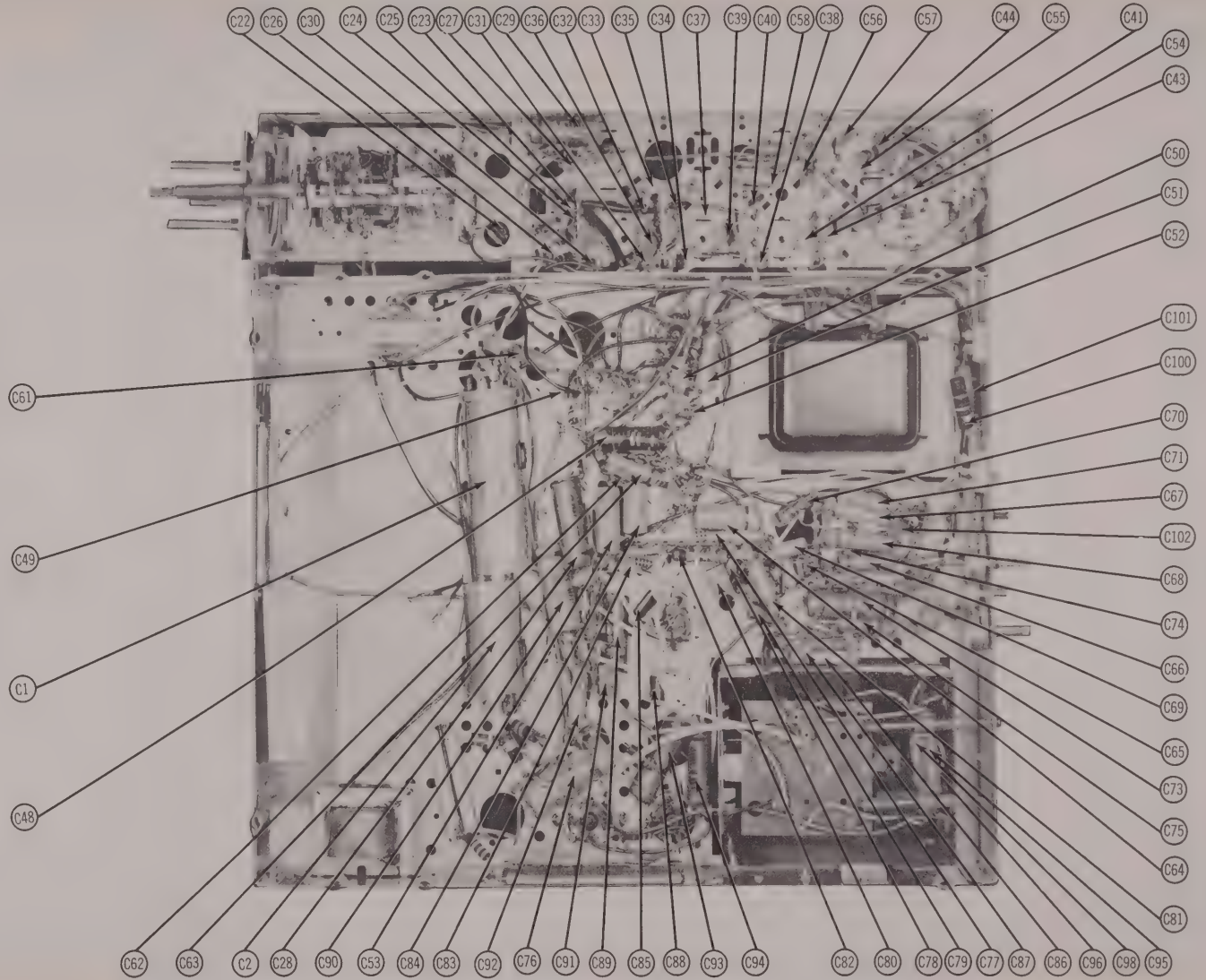

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1952
WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2)

WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1), H-739T17, H-739TU17 (Ch. V-2227-2)

DENVER, COLORADO

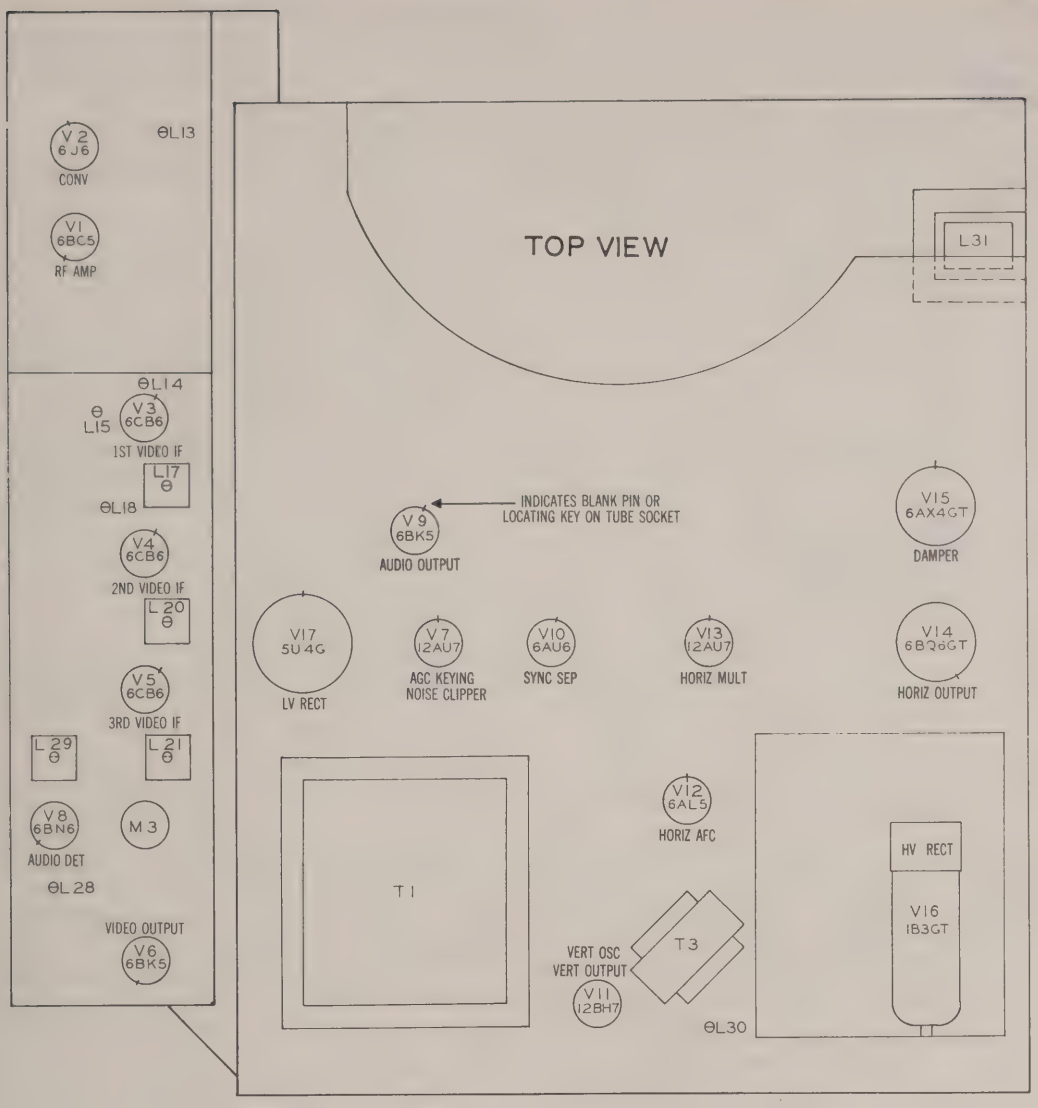


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V18
Has pic, no sound - V8, V9
Overloaded picture - V7

SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V12, V13
No vert. or horiz. sync - V10

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18
No vertical deflection - V11, V12
Poor vert. linearity or foldover - V11, V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V12, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 9 volt bias source to the ungrounded side of C28. Connect the positive lead to chassis.
The scope should be connected to the proper alignment point through a decoupling network consisting of a 47KΩ resistor in series with the hot lead and a 470MMF capacitor across the vertical input of the scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis near V5. Use short leads.	44MC (10MC Swp)	42.25MC 43.0MC 44.0MC 45.0MC 45.75MC	Any	Vert. amp to point (A). Low side to chassis.	A1, A2	Attach a detuning clip to pin 5 (plate) of V4. (Caution B+). Adjust A1 for maximum gain at 44MC. Adjust A2 for a symmetrical response curve with markers as shown in Fig.1
2.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis near V4.	"	"	"	"	A3, A4	Move detuning clip to pin 5 (plate) of V3. (Caution B+). Adjust A3 for maximum gain at 44MC. Adjust A4 for a symmetrical response curve as in Fig. 2.
3.	"	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis near V3.	"	"	"	"	A5, A6	Remove detuning clip from V3. Adjust A5 for maximum gain at 44MC. Adjust A6 for a symmetrical response curve as in Fig. 3. If difficulty is experienced in adjusting A5 and A6 as describes, preset A10 fully counter-clockwise and repeat adjustment of A5 and A6.
4.	"	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	"	"	"	"	A7, A8	Turn A9 completely clockwise. Adjust A7 for maximum response. Adjust A8 for symmetrical response.
5.	"	"	"	41.25MC	"	"	A9	Adjust for MINIMUM marker response.
6.	"	"	"	42.25MC 43.0MC 44.0MC 45.0MC 45.75MC	"	"	A7, A8	Readjust for response similar to Fig. 4.
7.	"	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	Not used.	47.25MC (400∿Mod)	"	"	A10	Adjust for MINIMUM 400∿ indication on scope. In areas where adjacent channel interference is not a problem A10 can be adjusted to and left at fully counter-clockwise position.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (15KC Swp)	4.5KC	Any	Vert. Amp. across volume control	A11	Set generator output to give minimum useful indication on scope. Adjust A-11 for maximum response centered about 4.5MC.
9.	"	"	"	"	"	"	A12	Set generator to give a strong signal and adjust A12 for maximum response at 4.5MC.
10.	"	"	Not used	4.5MC (400∿Mod.)	"	"	R8	Starting with a very low signal input gradually increase the level, at the same time rotating the quieting control, R8, back and forth until the signal level reaches the point where the AM output on scope dips to zero with a rise on each side as R8 is rotated. Set R8 for zero output at this signal level.

SOUND IF ALIGNMENT USING A TV SIGNAL

Remove the dummy converter tube and replace the original 6J6 in its socket.
Tune the receiver to a TV station and connect an attenuator between receiver and antenna so that the signal input to receiver can be varied from weak to strong.
Set the quieting control, R8, to the middle of its range.
Adjust A11 for maximum program sound . If peaks appear at two different slug settings use the one at farthest counter clockwise position.
Reduce the input signal to lowest usable level and check setting of A11.
Apply a strong signal and adjust A12 for maximum program sound. If two widely separated peaks appear use the one with A12 furthest counter clockwise.
If two peaks appear within a narrow range of adjustment, the signal strength being applied is too low or the quieting control is improperly adjusted.
Apply a very weak signal and adjust R8 for minimum noise. Do not leave R8 at maximum counter clockwise postions.

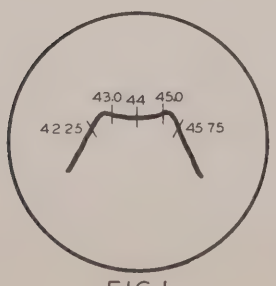


FIG. 1

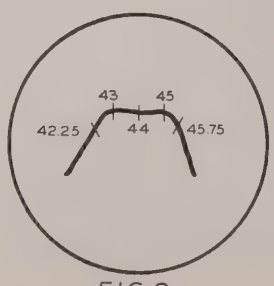


FIG. 2

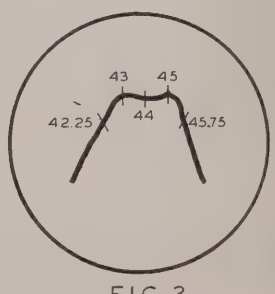


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Connect the bias supply as under Video IF Alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A13	Adjust to place video marker at 50% on high frequency side of IF response curve as in Fig. 5.
12.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check high band channels for correct video marker placement as in Fig. 5. If necessary make slight readjustment of A13 for best compromise on all channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
13.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A14	Adjust to place video marker at 50% on high frequency side of response curve as in Fig. 5.
14.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check low band channels for correct video marker placement as in Fig. 5. If necessary make slight readjustment at A14 for best compromise on all channels.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

FIG. 4

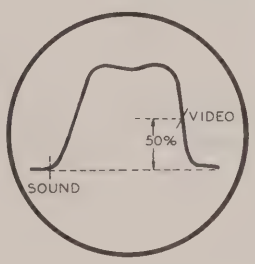
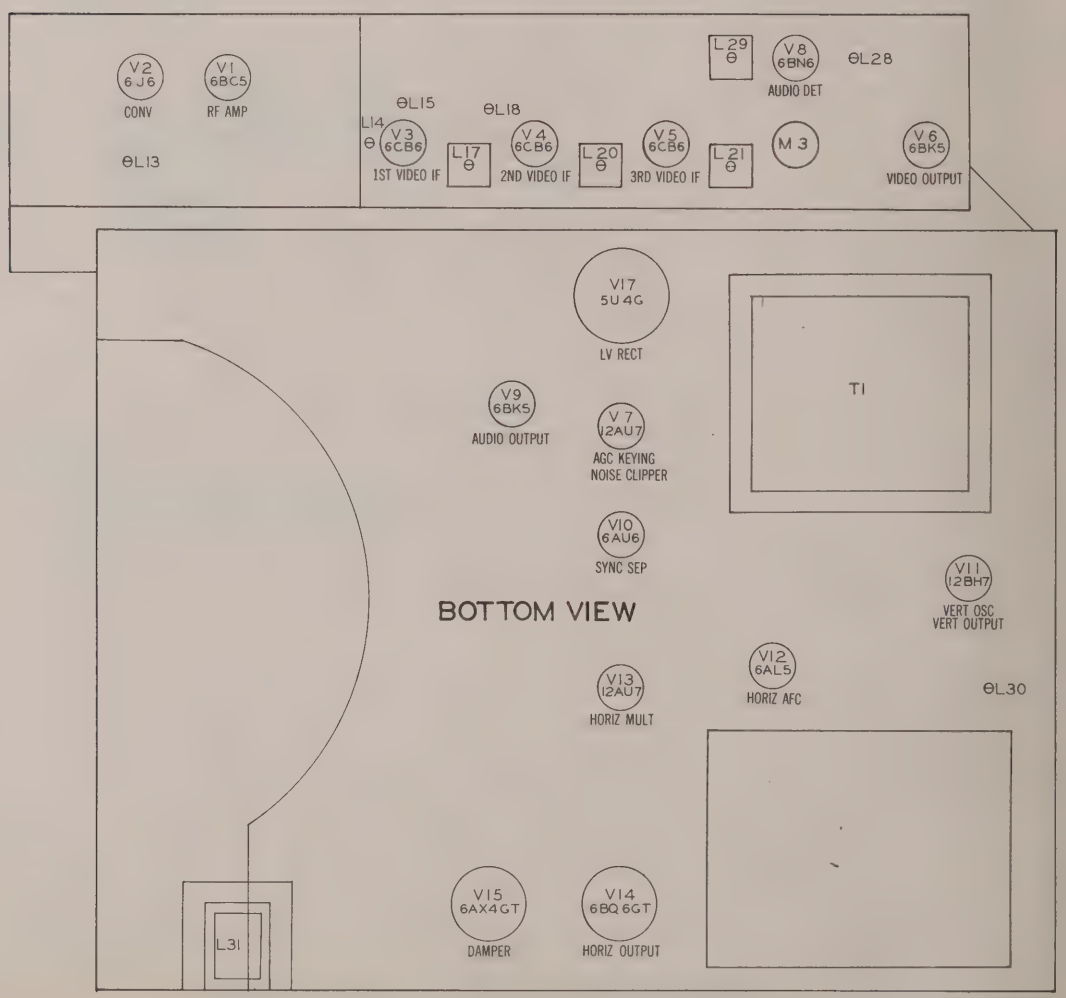


FIG. 5

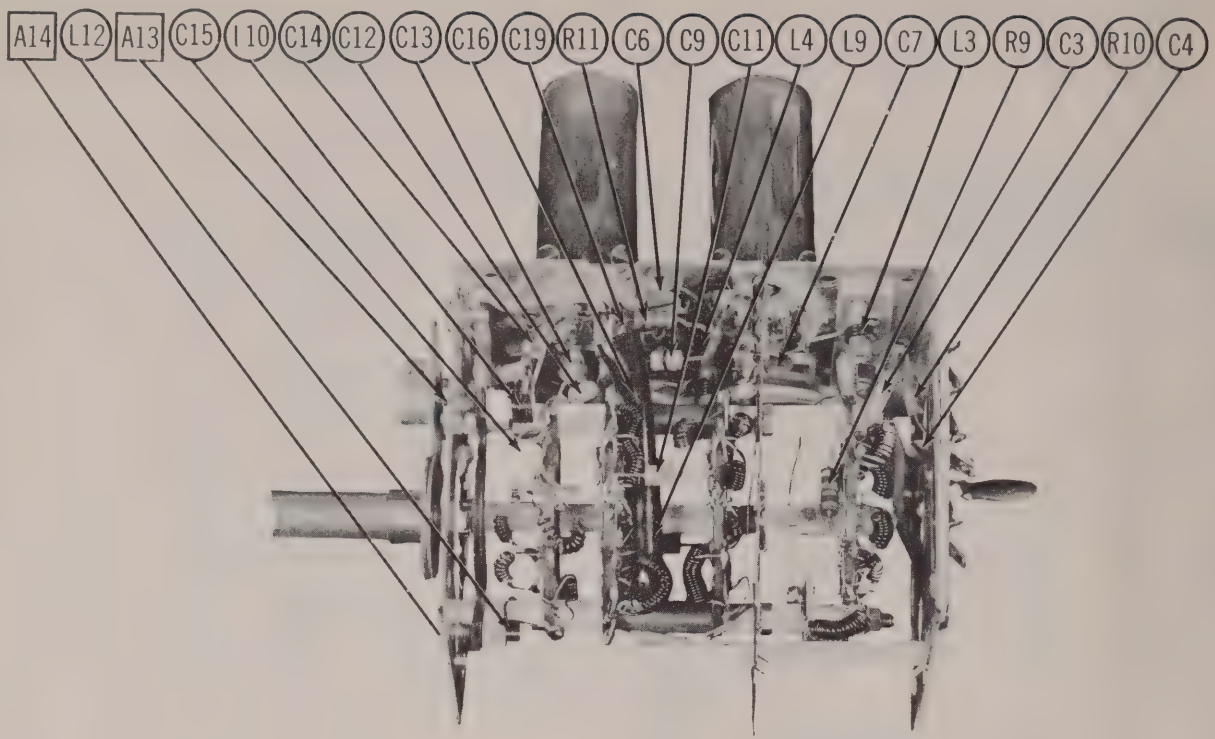
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1.9Meg	0Ω	0Ω	.1Ω	†3.8KΩ	†5.9KΩ	0Ω		
V 2	6J6	†11KΩ	†3.7KΩ	0Ω	.1Ω	220KΩ	15KΩ	0Ω		
V 3	6CB6	110KΩ	68Ω	.1Ω	0Ω	†5.8KΩ	†5.8KΩ	0Ω		
V 4	6CB6	110KΩ	68Ω	.1Ω	0Ω	†3.6KΩ	†3.6KΩ	0Ω		
V 5	6CB6	.4Ω	150Ω	.1Ω	0Ω	†4KΩ	†4KΩ	0Ω		
V 6	6BK5	†3.6KΩ	INF	2.2KΩ	.1Ω	0Ω	0Ω	2.2KΩ	†3.1KΩ	
V 7	12AU7	660KΩ	†71KΩ	45KΩ	.1Ω	.1Ω	1 Meg	1 Meg	1.2KΩ	0Ω
V 8	6BN6	280Ω	5.5Ω	.1Ω	0Ω	†23KΩ	5.3Ω	†330KΩ		
V 9	6BK5	†930Ω	15Ω	135Ω	.1Ω	0Ω	120Ω	135Ω	†570Ω	
V 10	6AU6	1 Meg	0Ω	0Ω	.1Ω	†40KΩ	†125KΩ	1.2KΩ		
V 11	12BH7	■7.6KΩ	1.5Meg	2.1KΩ	0Ω	0Ω	■3.8Meg	510KΩ	2.2KΩ	.1Ω
V 12	6AL5	1 Meg	0Ω	0Ω	.1Ω	1 Meg	0Ω	2 Meg		
V 13	12AU7	†37KΩ	2.7Meg	820Ω	.1Ω	.1Ω	†66KΩ	340KΩ	820Ω	0Ω
V 14	6BQ6GT	INF	0Ω	INF	†10KΩ	470KΩ	†68KΩ	.1Ω	33Ω	Top Cap ■33Ω
V 15	6AX4GT	INF	INF	1.3Meg	INF	†111Ω	INF	.1Ω	0Ω	
V 16	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ≤933.?
V 17	5U4G	INF	18KΩ	INF	20Ω	INF	22Ω	INF	18.5KΩ	
V 18	17LP4	0Ω	1.5Meg	Pin 6 4.4KΩ	Pin 10 ■33KΩ	Pin 11 †100KΩ	Pin 12 .1Ω			

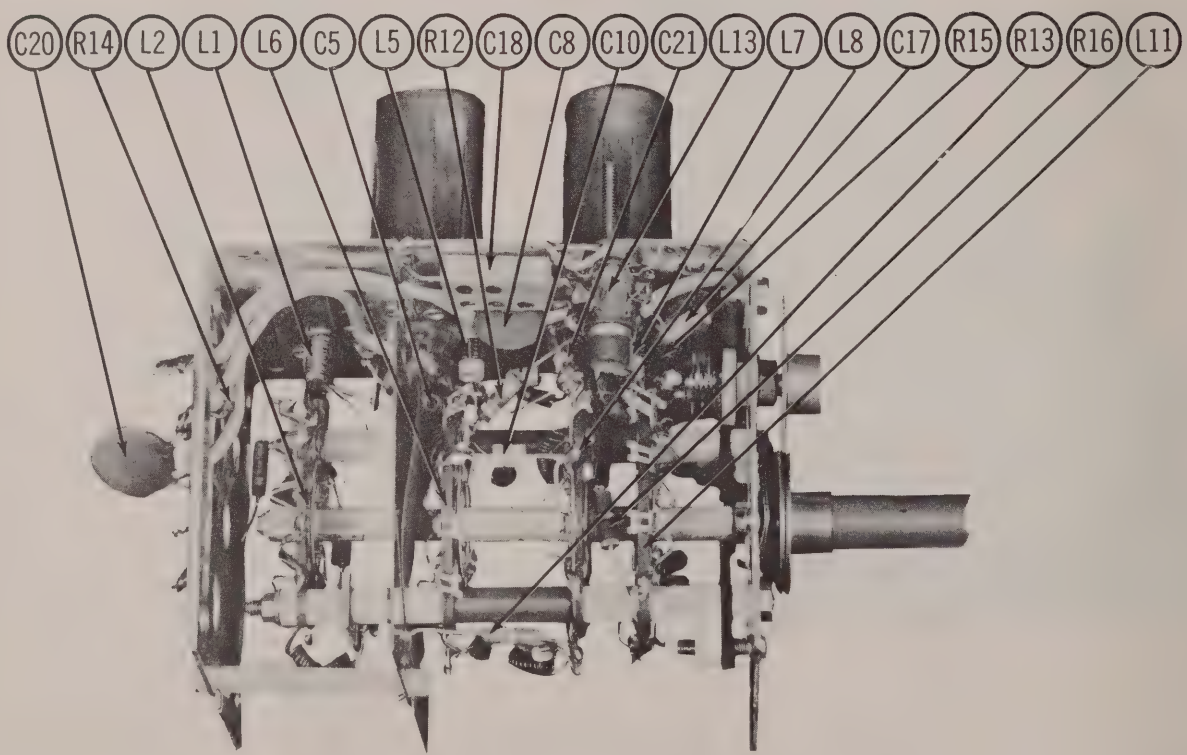
† MEASURED FROM PIN 8 OF V17.
■ MEASURED FROM PIN 3 OF V15.



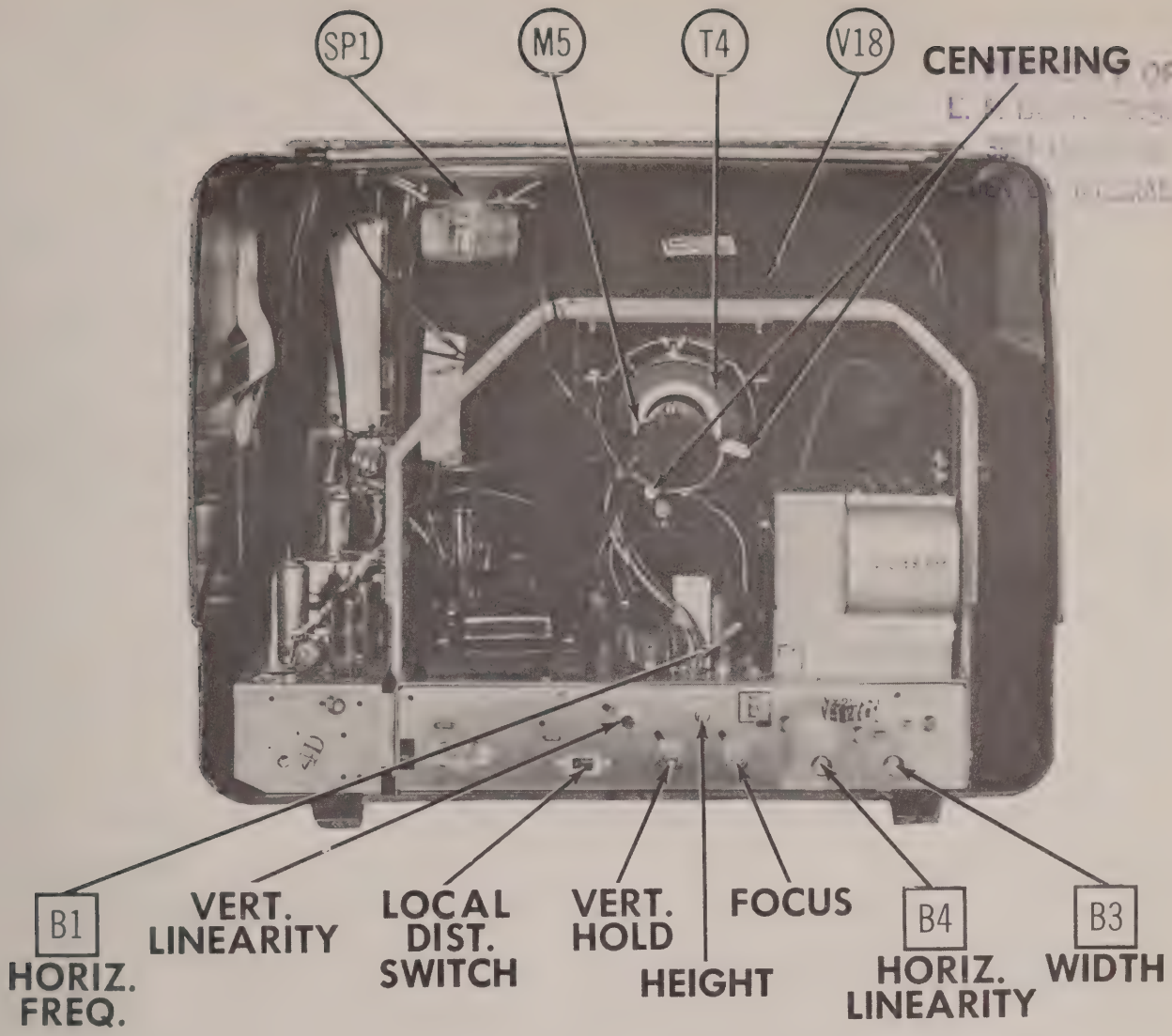
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

When necessary, the horizontal oscillator coil can be adjusted as follows:

1. Short out the horizontal oscillator coil, L30 with a short jumper wire.
2. Set the horizontal hold control to the center of its mechanical range.
3. Connect the DC probe of a VTVM to the junction of R92 and C84. Connect the common lead to chassis.
4. Adjust the horizontal multivibrator trimmer (B2) for zero reading on VTVM. If zero can be approached but not quite reached it may be necessary to reset the horizontal hold control slightly to one side of mid-range so that zero reading can be obtained on VTVM.
5. Remove the jumper from across the horizontal oscillator coil.
6. Adjust the horizontal oscillator slug (B1) for zero reading on VTVM.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See LOSS OF HIGH VOLTAGE

INSUFFICIENT SWEEP

Check by substitution V13, V14 and V15. Check waveform at W14.

If Satisfactory	If Unsatisfactory
Check C93, C95, C96, C98, T2, yoke and other associated components.	Check C91, C92, C88, horizontal drive trimmer and other associated components.

DRIVE LINES

Check by substitution V15,V14, and V13. Check horizontal drive adjustment (B2). Check C95, C96, T2, yoke and other associated circuit components.

COMPRESSED AT LEFT SIDE

Check by substitution V13, V14 and V15. Check T5 and T6 for shorted turns. Check T2, yoke, C95, C96, C98 and other associated circuit components.

FOLDS

Check by substitution V15 and V14. Check C95, C96, T2, yoke and other associated circuit components.

XMAS TREE EFFECT

Substitute V13. Check L30 for shorted turns. Check C86 and C88 for open.

VERTICAL

LOSS OF SWEEP

Substitute V11. Check waveform at W8.

If Satisfactory	If Unsatisfactory
Check T3, R80, R81 and other associated circuit components.	Check C73, C71, C72 and other components associated with V11A.

INSUFFICIENT SWEEP

Substitute V11. Check C2C, C2B and other components associated with V11. Proceed as outlined under LOSS OF SWEEP.

COMPRESSED AT BOTTOM

Substitute V11. Check C2C and other associated circuit components.

COMPRESSED AT TOP

Substitute V11. Check C2C, C2B, T3, yoke and other associated components.

FOLDS

Substitute V11. Check C2B, T3, yoke and other associated circuit components.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V12 and V13. Check C77, C84, C79, C80, C88 and other associated circuit components.

CRITICAL SYNC

Substitute V12 and V13 . Check C82, C83, C89 and other associated components.

PULLING PICTURE

Check by substitution V12, V13 and V14. Check C82, C83, C91 and other components associated with V12 and V13.

VERTICAL

LOSS OF SYNC

Substitute V10 and V11. Check waveform at W5 for signal overload and sync compression.

If Satisfactory	If Unsatisfactory
Check vertical integrator network. Check C66, C71 and other associated circuit components.	Check components associated with V6 and video detector assembly.

CRITICAL SYNC

Substitute V10 and V11. Proceed as outlined under LOSS OF SYNC.

TRIGGERING

Substitute V10 and V11. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Check coupling network between video amplifier stage and picture tube. Check picture tube.

SOUND BARS

Check adjustment of local oscillator. Check 4.5MC take-off trap, (A11). Check video IF alignment.

POOR RESOLUTION

Check by substitution V1, V2, V3, V4, V5 and V6. Check components associated with the video IF and amplifier stages. Check video IF alignment.

POOR CONTRAST

Substitute V.. Check video detector assembly. Check video coupling network to picture tube. Check picture tube.

SMEAR

Substitute V6. Check video detector assembly. Check L25 for open. Check R37, R38 and R39 for change of value. Check C47 for change of value. Check picture tube.

ONE WIDE BLACK BAR ACROSS PICTURE

Check tuner, video IF and video amplifier tubes for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Substitute V8 and V9. Check C59, T7, speaker and other associated components. Check alignment of the gated beam detector as outlined in the alignment table.

BUZZ

Check adjustment of the quieting control. Substitute V8. Check adjustment of the quadrature coil (A12). Check components associated with V8.

DISTORTED

Substitute V8 and V9. Check stage of V9 using audio signal generator.

If Distorted	If Undistorted
Check components associated with V9.	Check the gated beam detector circuit and adjustments.

ALTERNATE TUNER SCHEMATIC

RF AMP 6BQ7
MIXER 6X8
OSC 6X8
265V
TO JUNCTION OF L14 & R18
TO JUNCTION R20 & C17
TO JUNCTION OF R20 & R21
FINE TUNING
UHF #2
UHF #1
CHANNEL SELECTOR SW SHOWN IN CHANNEL 4 POSITION
WESTINGHOUSE TUNER MODEL V-11333-1 USED IN MODEL V-2227-2 TV CHASSIS
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	7BK	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6BK5	6BK5	9BQ	
V7	AGC Keying-Noise Clipper	12AU7	12AU7	9A	
V8	Audio Detector	6BN6	6BN6	7DF	
V9	Audio Output	6BK5	6BK5	9BQ	
V10	Sync Separator	6AU6	6AU6	7BK	
V11	Vert. Oscillator - Vert. Output	12BH7	12BH7	9A	
V12	Horiz. AFC	6AL5	6AL5	6BT	
V13	Horiz. Mult.	12AU7	12AU7	9A	
V14	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V15A	Damper	6AX4GT	6AX4GT	4CG	
B	Damper	6AS4GT	6AS4GT	4CG	
V16	HV Rectifier	1B3GT	1B3GT	3C	
V17	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V18	17LP4	17LP4 17VP4	12C 12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	V-9891	AFH4-93		DG92		FP428.4	TVL-4720	
B	▲40	450								
C	▲30	350								
D	30	350								
C2A	▲10	450	V-10306-1	AFH3-140 @RS50/50		C104	FP385 TC39		TVL-3753	
B	▲30	450								
C	▲150	50								
C3	15						N330K-150			
C4	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C5	470			S1470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C6	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C7	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C8	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C9	.3						NP0K-R3			
C10	.5				TCZ-.5		NP0K-R5			
C11	1.5			SII.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C12	.4						NP0K-R4			
C13	1.5			SII0N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C14	1.5						N330K-1R5			
C15	.5				TCZ-.5		NP0K-R5			
C16	62						N330K-620			
C17	15						N330K-150			
C18	300	500								
C19	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C20	5000		V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C21	470			S1470	D6-471	TM5T1	GP2K-471	UC-5347	5GA-T47	
C22	5000		V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C23	15			RICC202J.L20K			N330K-120			
C24	1.0		V-5658-1	SIINP0	TCE-1		NP0K-010		5TCCB-V1	
C25	12			R3CC202J.L20K			N330K-120			
C26	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C27	.01	200	RCP10W2103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C28	.01	400	RCP10W4254M	P488-25		PTE4P25		PT4025	4TM-P25	
C29	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C30	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C31	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C32	1.0		V-5658-1	SIINP0	TCZ-1		NP0K-010		5TCCB-V1	
C33	12		R3CC202J.L20K				N330K-120			
C34	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C35	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C36	5000		V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C37	.5				TCZ-.5		NP0K-R5			Note 1
C38	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C39	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C40	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5GA-T8	
C41	3.3		V-9926-2	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C42	12		R3CC202J.L20K				N330K-120			
C43	5		V-9926-3	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C44	5000		V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C45	33		V-5658-13	SI33	D6-330		GP1K-330	UC-5433	5GA-Q33	
C46	33		V-5658-13	SI33	D6-330		GP1K-330	UC-5433	5GA-Q33	
C47	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C48	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C49	220	500	RCM20B221K							
C50	100	500	RCM20B101K	1469-0001		SR5T1		MCB235	MS-31	
C51	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C52	5000	400	V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C53	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C54	3.3		V-9926-2	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C55	3.3		V-9926-2	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C56	5000		V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C57	5000		V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C58	.002	400	RCP10W6202M	P488-002	DD-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C59	.02	400	RCP10W4203M	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C60	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C61	.002	600	RCP10M6202M	P488-002	DD-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C62	270	500	RCM20B271K	1469-0003		SR5T3		MCB241	MS-33	
C63	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C64	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C65A	5000		V-9044-1	BPD-2X0047	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	5000					TM5D5	811-005	DC-525		
C66	.005	400	RCP10W4503M	P488-005	D6-502	PTE4S5	GP2-333-502	PT835	6TM-D5	
C67	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C68	.02	600	RCP10W6203M	P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C69	.002	400	RCP10W6202M	P688-002	DD-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C70	.001	600	RCP10W6102M	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C71	.001	1000		P1088-001		PTE10D1		PT1021	MD-D1	Note 2
C72	.002	600	RCP10M6202M	P688-002	D6-102	PTE6D2	GP2-333-202	PT622	6TM-D2	Note 2
C73	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C74	.02	600	RCP10W6203K	P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C75	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C76	.25	600	RCP10W6254M	684-25		PTE6P25		PT6025	6TM-P25	
C77	100	500	RCM20B101K	1469-0001		SR5T1		MCB235	MS-31	
C78	100	500	RCM20B101K	1469-0001		SR5T1		MCB235	MS-31	
C79	680	500	RCM20B681K	1469-0007		2R5T7			MS-37	
C80	390	500	RCM20B391K	1469-0004		1R5T4		MCB243	MS-34	
C81	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C82	.005	400	RCP10W4502M	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C83	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C84	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C85	100	500	RCM20B101K	1469-0001		SR5T1		MCB235	MS-31	
C86	3900	500	RCM30C392K	1484-004		1DR5D4		MCB463	MS-34	
C87	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C88	100	500	RCM20B101K	1469-0001		SR5T1		MCB235	MS-31	
C89	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C90	.25	400	RCP10W4254M	P488-25		PTE4P25		PT4025	4TM-P25	Note 3
C91	390	500	RCM20B391K	1469-0004		1R5T4		MCB243	MS-34	
C92	.01	600	RCP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C93	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C94	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C95	.04	400	RCP10W4403M	P688-04		PTE6S4		PT614	6TM-S4	
C96	.06	400	RCP10W6603M	P688-06		PTE6S6		PT616	6TM-S6	
C97	500	20000	V-9901-3	HV-11	TV-4-502		413-501		30DK-T5	
C98	.25	400	RCP10W4254M	P488-25		PTE4P25		PT4025	4TM-P25	
C99	51		V-9782-10510J							Note 4
C100	.01	600	V-50-0-1	6892X-01		PJ6S1		PT611	6TM-S1	
C101	.01	600	V-5040-1a	6892X-01		PJ6S1		PT611	6TM-S1	
C102	5000		V-5596	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	

Note 1. Not used in all Models.
Note 2. When C72 is used, C71 becomes .002MFD (part #RCP10M6202M).
Note 3. Some Models use .1MFD in this application (part #RCP10W4104M).
Note 4. When the V-11571-2 deflection yoke is used, C89 becomes 43MMF (part #V-9792-10430J).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	15EΩ	½	V-11605-1	QJ-464*				Picture Tap ⑤ 4.5KΩ & 9KΩ-Panel
B	500KΩ	½						Volume & Switch Tap ⑤ 65KΩ-Rear
R2A	50KΩ	½	V-10914-1	QH-123	AG-44-S	AB-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	KS8-2	AK-4	Not Req.	Attach to R2A
R3A	125KΩ	½	V-10915-1	QH-230	AG-53-S	AB-40	U-415	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R4A	2 Meg	½	V-9894-2	QJ-139	AG-85-S	AB-75	SU-56	Focus
B	Shaft		Not Req.	Not Req.	KS8-3	AK-1	Not Req.	Attach to R4A
R5A	5 Meg	½	V-9813C-5	QH-141	AG-85-S	AB-37	SU-87	Height
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R5A
R6A	5000Ω	½	V-9894E-4	QH-114	AG-10-S	AB-10	U-14	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-1	Not Req.	Attach to R6A
R7A	5000Ω	½	V-6463	QH-114	AG-10-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R7A
R8	500Ω	1	V-11345-2					Quieting-Wire Wound

* CONCENTRIKTI EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B13-116XX & P1-212 (Panel)
B16-133X & R2-326 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R9	220Ω	½		BTS-220Ω	
R10	150Ω	½		BTS-150	
R11	220Ω	½		BTS-220Ω	
R12	470Ω	½		BTS-470	
R13	220KΩ	½		BTS-220K	
R14	470Ω	½		BTS-470	
R15	15KΩ	½			
R16	820Ω	½			
R17	150Ω	½	RC20AE151K	BTS-150	
R18	10KΩ	½	RC20AE103M	BTS-10K	
R19	560KΩ -5%	½	RC20AE564J	BTS-560K-5%	
R20	1.5Meg-5%	½	RC20AE155J	BTS-1.5Meg-5%	Note 1
R21	18Meg-5%	½	RC20AE186J	BTS-18Meg-5%	
R22	100KΩ-5%	½	RC20AE104J	BTS-100K-5%	
R23	10Ω	½	RC20AE100K	BTS-10	
R24	68Ω	½	RC20AE680K	BTS-68	
R25	270Ω	½	RC20AE272K	BTS-270	
R26	10KΩ	½	RC20AE103M	BTS-10K	
R27	4700Ω-5%	½	V-9927-2	BTS-4700-5%	
R28	68Ω	½	RC20AE680K	BTS-68	
R29	470Ω	½	RC20AE471M	BTS-470	
R30	4700Ω-5%	½	V-9927-2	BTS-4700-5%	Note 2
R31	150Ω	½	RC20AE151K	BTS-150	
R32	470Ω	½	RC20AE471M	BTS-470	
R33	1000Ω	½	RC20AE102K	BTS-1000	
R34	2200Ω	½	RC20AE222K	BTS-2200	
R35	15KΩ	½	RC20AE153K	BTS-15K	
R36	4700Ω	½	RC20AE472K	BTS-4700	
R37	2200Ω	2	RC40AE222K	BTS-2200	
R38	2700Ω	2	RC40AE272K	BTS-2700	
R39	22KΩ	1	RC30AE223K	BTA-22K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R40	150KΩ	½	RC20AE154K	BTS-150K	
R41	220KΩ	½	RC20AE224K	BTS-220K	
R42	1.5Meg	½	RC20AE155K	BTS-1.5Meg	
R43	33KΩ	½	RC20AE333K	BTS-33K	
R44	560Ω	½	RC20AE562K	BTS-5600	
R45	68KΩ	½	RC30AE683K	BTA-68K	
R46	100KΩ	½	RC20AE104K	BTS-100K	
R47	180KΩ	½	RC20AE184K	BTS-180K	
R48	82KΩ-5%	½	RC20AE823J	BTS-82K-5%	
R49	820Ω	½	RC20AE822K	BTS-820Ω	
R50	47KΩ-5%	½	RC20AE743J	BTS-47K-5%	
R51	1 Meg	½	RC20AE105K	BTS-1 Meg	
R52	22KΩ	½	RC40AE223K	BTS-22K	
R53	470Ω	½	RC20AE471M	BTS-470	
R54	330KΩ	½	RC20AE334K	BTS-330K	
R55	10KΩ	½	RC20AE103M	BTS-10K	
R56	120Ω	½	RC20AE121K	BTS-120	
R57	120Ω	½	RC20AE121K	BTS-120	
R58	470Ω	½	RC40AE471K	BTS-470	
R59	470KΩ	½	RC20AE474K	BTS-470K	
R60	1 Meg	½	RC20AE105K	BTS-1 Meg	
R61	1200Ω	½	RC20AE122K	BTS-1200	
R62	270KΩ	½	RC20AE274K	BTS-270K	
R63	100KΩ	½	RC20AE104K	BTS-100K	
R64	220KΩ	½	RC20AE224K	BTS-220K	
R65	18KΩ	½	RC20AE183K	BTS-18K	
R66	22KΩ	½	RC20AE223K	BTS-22K	
R67	8200Ω	½	RC20AE822K	BTS-8200	
R68	8200Ω	½	RC20AE822K	BTS-8200	
R69	470KΩ	½	RC20AE474K	BTS-470K	
R70	100KΩ	½	RC20AE104K	BTS-100K	
R71	47KΩ	½	RC20AE473K	BTS-47K	
R72	10Meg	½	RC20AE106K	BTS-10Meg	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R73	2.2Meg	½	RC20AE225K	BTS-2.2Meg	
R74	18Ω	½	RC20AE180K	BTS-18	Note 3
R75	100KΩ	½	RC30AE104K	BTA-100K	
R76	3.3Meg	½	RC20AE335K	BTS-3.3Meg	
R77	1.5Meg	½	RC20AE155K	BTS-1.5Meg	
R78	100Ω	½	RC20AE101K		
R79	680Ω	½	RC20AE681K	BTS-680	
R80	15KΩ	2	RC40AE153K	BTS-15K	
R81	10KΩ	2	RC40AE103K	BTS-10K	
R82	18KΩ-5%	½	RC20AE183K	BTS-18K-5%	
R83	5800Ω	½	RC20AE582K	BTS-5800	
R84	5000Ω	½	RC20AE582K	BTS-580	
R85	560Ω	½	RC20AE581K	BTS-580	
R86	390Ω	½	RC20AE391K	BTS-390	
R87	1 Meg	½	RC20AE105K	BTS-1 Meg	
R88	1 Meg	½	RC20AE105K	BTS-1 Meg	
R89	220KΩ	½	RC20AE224K	BTS-220K	
R90	470KΩ	½	RC30AE474K	BTS-470K	
R91	18KΩ	½	RC30AE183K	BTS-18K	
R92	47KΩ	½	RC30AE473K	BTS-47K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R93	820Ω	½	RC20AE821K	BTS-820	
R94	27KΩ	½	RC20AE273K	BTS-27K	
R95	270KΩ	½	RC30AE274K	BTS-270K	
R96	56KΩ	½	RC20AE563K	BTS-56K	
R97	22KΩ	½	RC20AE223K	BTS-22K	
R98	10KΩ	½	RC20AE103K	BTS-10K	Note 4
R99	10KΩ	½	RC20AE103K	BTS-10K	
R100	68000Ω	1	RC20AE683K	BTS-6800	
R101	470KΩ	1	RC20AE474K	BTS-470K	
R102	150Ω	1	RC20AE151M		
R103	33Ω	1	RC30AE330K	BW-1-33	
R104	82000Ω	5	V-11328-9	13/4A-8000	
R105	39000Ω	2	RC40AE392K	BTB-3900	Note 5
R106	68KΩ	1	RC30AE683K	BTA-68K	Note 6
R107	100Ω	1	RC20AE102K	BTS-1000	
R108	330KΩ	1	V-9927-7		
R109	50Ω	10	V-11328-8		
R110 A	20000Ω	11	V-10054-3		
B	10000Ω				
R111	220KΩ	1	RC30AE224M	BTA-220K	

Note 1. Some models may use a 680KΩ resistor in this application.
Note 2. Some models may use a 47KΩ resistor in this application.
Note 3. Some models may use a 10Ω resistor in this application.
Note 4. Some models may use a 27KΩ resistor in this application.
Note 5. Some models may use a 2200Ω resistor in this application.
Note 6. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Westinghouse PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No.	RCA TYPE No.
T1	117VAC @1.76A	600VCT ⑤ 240ADC	5VAC @ 9A	12.6VCT @ 3A	V-11544-2		P-3066 ① ②		R-50BC ① ③	

① Use low voltage taps on high voltage secondary.
② Tape extra low voltage windings.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI	RATING: DC RESISTANCE SEC	REPLACEMENT DATA: Westinghouse PART No	STANCOR PART No	MERIT PART No.	CHICAGO PART No	TRIAD PART No.	RCA TYPE No.	NOTES
T2	983Ω tap ⑤ 30Ω	3.5Ω SEC. 2	V-11548-2		HVO-9 ① ②		D-19 ③ ④		Horiz. Output Trans.
T3	500Ω, 83Ω tap ⑤ 7Ω	0Ω	V-10906-1	A-6141	A-3039	TSO-12	A-104X		Vert. Output Trans.
T4A	26Ω		V-11570-1 ⑤ ⑭	DY-11A ⑥		TY-7 ⑧	Y-19 ⑦		Horiz. Defl. Coils
B	45Ω								Vert. Defl. Coils
T5	21Ω		V-11545-1	WC-5 ⑨	MWC-1 ⑩ ⑤	TWL-1 ⑪	WC-12 ⑫		Horiz. Linearity Coil
T6	5Ω		V-11546-3		MWC-6	TL-3 ⑪	WC-12 ⑫		Width Coil

① Use with width coil MWC-1.
② Connect hot side of yoke and damper cathode to terminal 7. Connect yoke return to terminal 3. Use secondary of MWC-1 for sweep and AFC (raster and no picture, reverse secondary).
③ Use with width coil WC-11.
④ Jumper terminal 7 and 8. Connect damper cathode and hot side of yoke to terminal 7 or 8. Connect yoke return to terminal 3. Connect WC-11 secondary to keyer and AFC (picture and no raster, reverse secondary).
⑤ Yoke assy. contains yoke V-11571-1
⑥ Use original horizontal deflection coil network if necessary.
⑦ Use original deflection coil network.
⑧ Do not use secondary.
⑨ Enlarge mounting hole.
⑩ Connect to coded blue and red terminals.
⑪ Do not use tap.
⑫ Includes positioning device
⑬ Connect to coded blue and green terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Westinghouse PART No	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	NOTES
T7	4.8KΩ	3.3Ω	364Ω .62Ω	V-9982-2	A-3877	A-2930	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C IMP.	REPLACEMENT DATA: Westinghouse PART No	JENSEN PART No	QUAM PART No	NOTES
SP1	5 1/4"	PM	3.3Ω	V-10030-1	ST-803 Mod. P525-V	52A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	0Ω CT	0Ω					Low Channel secondary-0Ω
L2	Ant. Coils	0Ω						
L3	Ant. Coil	0Ω						Cha nnel 13
L4	Fil. Choke	0Ω						
L5	RF Coil	0Ω						Channel 13
L6	RF Coils	0Ω						
L7	Mixer Grid Coil	0Ω						Channel 13

WESTINGHOUSE MODELS H-736T17, H-738T17 (Ch. V-2227-1), H-739T117, H-739TU17 (Ch. V-2227-2)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (CONT.)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L8	Mixer Grid Coil s	0Ω						
L9	Feedback Coil	0Ω						
L10	Osc. Plate Coil	0Ω CT						Channel 13
L11	Osc. Coils	0Ω						
L12	Osc. Coil	0Ω						Channel 6
L13	Conv. Plate	.1Ω						
L14	1st. Video IF	0Ω		V-9882-6				
L15	Assoc. Sound Trap	0Ω		V-10771-1				
L16	Fil. Choke	0Ω		V-4886-2			4602	1.1 Microhenries
L17	2nd. Video IF	.5Ω	.4Ω	V-9879				
L18	Adj. Channel Sound Trap	0Ω		V-10771-1				
L19	Fil. Choke	0Ω		V-4886-2			4602	1.1 Microhenries
L20	3rd. Video IF	.5Ω	.4Ω	V-9879				
L21	4th. Video IF	.5Ω	.5Ω	V-9880				
L22	Series Peaking Coil	1.1Ω		V-4886-1		TV-180	4624	14 Microhenries
L23	Series Peaking Coil	6.5Ω		V-9915-1	19-3093	TV-181	6177	100 Microhenries
L24	Shunt Peaking Coil	9Ω		V-5902-5	19-3250	TV-185	6181	250 Microhenries
L25	Series Peaking Coil	6.5Ω		V-9915-1	19-3093	TV-181	6177	100 Microhenries
L26	Shunt Peaking Coil	11Ω		V-9915-3	19-3500	TV-188	6174	500 Microhenries
L27	Series Peaking Coil	1.1Ω		V-4886-1		TV-180	4624	14 Microhenries
L28	Sound IF	5.5Ω		V-9883-3	20-1005	TV-151	1469	
L29	Quadrature Coil	5.3Ω		V-11396-1	17-1031 †			
L30	Horiz. Osc.	75Ω		V-6764	19-1576	TV-163	6210	

† Drill mounting holes.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L31	.230ADC	40Ω	1.24Ω	V-6471-2	C-2326 ①	C-2991 ①	TR-1733 ①	C-23X ①

① Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1A	RF Tuner	V-11385-1	Models H-736T17, H-738T17, H-739T17
B	RF Tuner	V-11333-1	Model H-739TU17
M2	RF Tuner (UHF)		Model H-803, (Used on Model H-739TU17)
M3	Crystal Diode	V-10916-1	Video Detector (CK706, 1N64 or 1N60)
M4	Switch	V-5406	Local-Distance Selector
M5	Ion Trap	V-9784-4	
B2	Trimmer Cap.	V-11228-1	Horiz. Mult. (5-40MMF)
	Cabinet	V-1273-3	Model H-736T17
	Cabinet	V-1299-6	Models H-738T17, H-739T17 and H-739TU17
	Back Cover	V-10928-5	Model H-736T17
	Back Cover	V-10962-23	Model H-738T17
	Back Cover	V-10962-25	Models H-739T17, H-739TU17
	Safety Glass	V-11306-2	Model H-736T17
	Safety Glass	V-11853-1	Model H-738T17
	Safety Glass	V-11853-2	Models H-739T17 and H-739TU17
	Mask	V-11308-4	Model H-736T17
	Mask	V-10931-1	Model H-738T17
	Mask Assembly	V-11125-1	Models H-739T17 and H-739TU17
	Mask (Picture)	V-10927-1	Model H-738T17
	Knob	V-9938-1	Off/On Volume, Models H-736T17 and H-738T17
	Knob	V-9938-4	Off/On Volume, Models H-739T17 and H-739TU17
	Knob	V-9939-1	Picture, Models H-736T17 and H-738T17
	Knob	V-9939-5	Picture, Models H-739T17 and H-739TU17
	Knob	V-10926-1	Horiz. Hold and Brightness (2 Used)
	Knob	V-9940-1	Fine Tuning
	Knob	V-10676-1	Channel Selector, Models H-736T17 and H-738T17
	Knob	V-11146-1	Channel Selector, Model s H-739T17 and H-739TU17

TROUBLE SHOOTING AIDS (CONT.)

POWER

SMALL RASTER WEAK SOUND

Substitute V17. Check B+ filter network.

DIM PICTURE

Substitute V17. Check B+ filter network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V13, V14, V15 and V16. Check waveform at W14.

If Satisfactory	If Unsatisfactory
Check C97, R108, T2, C93, yoke and other associated components.	Check C91, C92, C88, C85 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V13, V14, V15, V16 and V17. Proceed as outlined under LOSS OF HIGH VOLTAGE.

BLOOMING

Check by substitution V16, V15 and V14. Check picture tube, T2, R108, C97 and other associated circuit components.

GENERAL

RASTER SOUND NO PICTURE

See LOSS OF VIDEO

RASTER SNOW NO PICTURE NO SOUND

Check by substitution V1, V3, V4 and V5.

TOTAL LOSS OF SYNC

Substitute V10. Check associated circuit components.

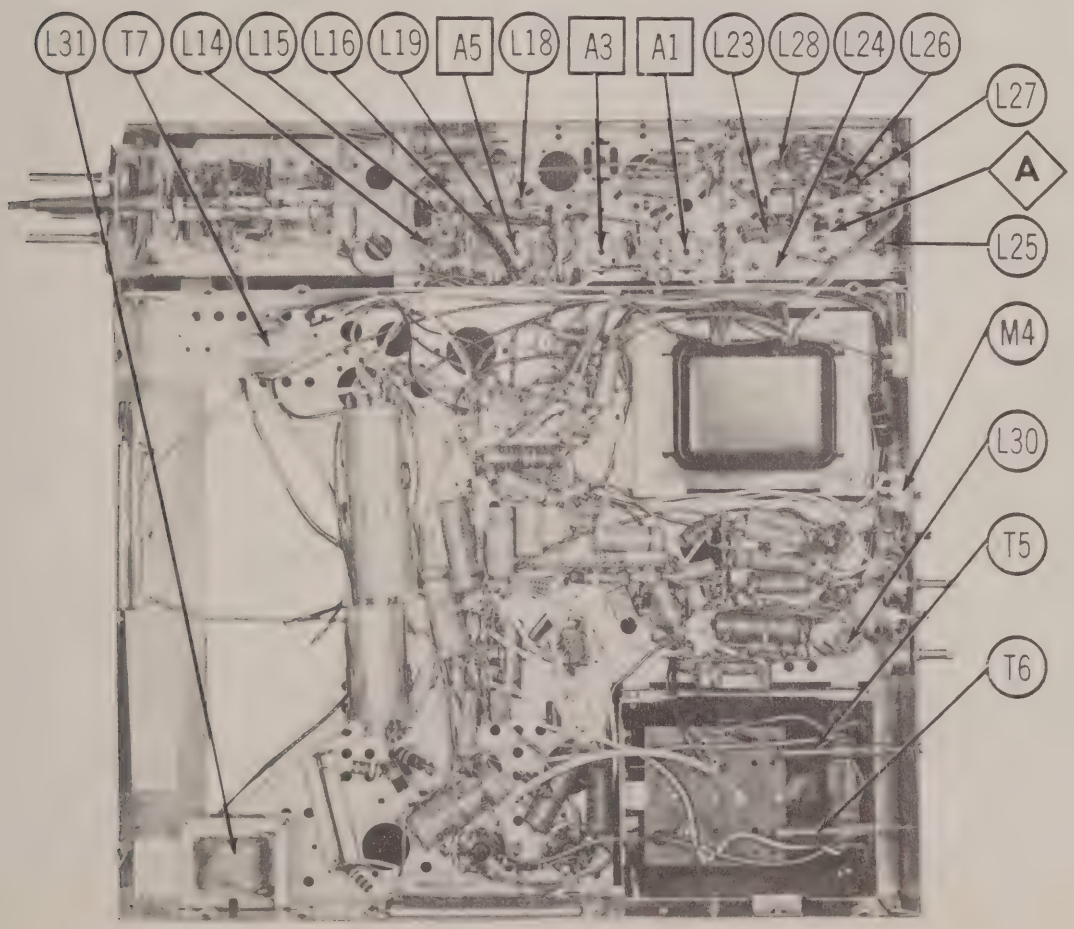
INTERMITTANT STREAKS

Check high voltage section for corona discharge and arcing.

DEAD SET

Check AC interlock assembly. Check switch on volume control. Check T1.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



CHASSIS-BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENT.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removing the channel selector and fine tuning knobs.

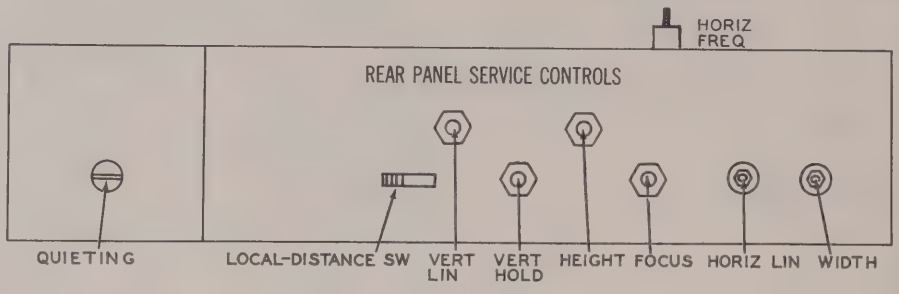
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug, L30, until, picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT-QUIETING CONTROL-Rear Apron of Chassis.

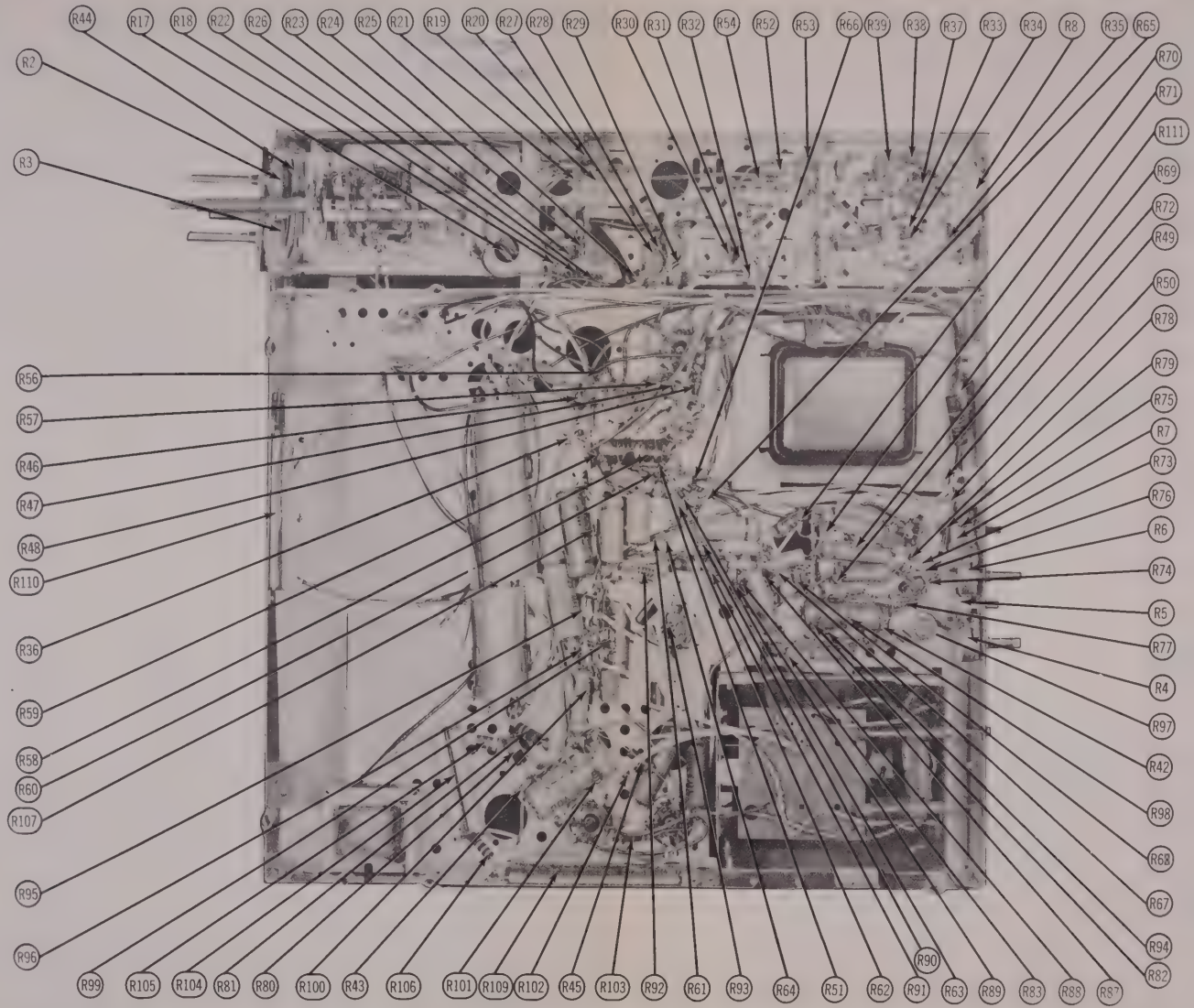
If necessary, adjust slightly for minimum noise in receiver output. If results are unsatisfactory, see sound IF alignment using TV signal on page 6.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push on type control knobs from front panel.
2. Remove 2 metal screws. Disconnect built-in antenna and transmission line. Remove rear cover.
3. Disconnect speaker. Remove 2 speaker nuts. Remove speaker.
4. Remove 4 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ROLAND
MODEL 8FT1M

ROLAND
MODEL 8FT1M

TRADE NAME	Roland, Model 8FT1M		
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.		
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver		
TUBES (Seven)	Types 6BJ6 FM RF Amp., 12AT7 FM Conv., 12BE6 AM Conv., 6BJ6 FM AM IF Amp., 12AU6 Driver, 19T8 FM Det.-AM Det.-AVC-AF Amp., 50C5 Audio Output		
POWER SUPPLY	110-120 Volts AC-DC	RATING	.26 Amp. @ 117 Volts AC
TUNING RANGE -BROADCAST	540-1650 KC	FREQ. MOD.	88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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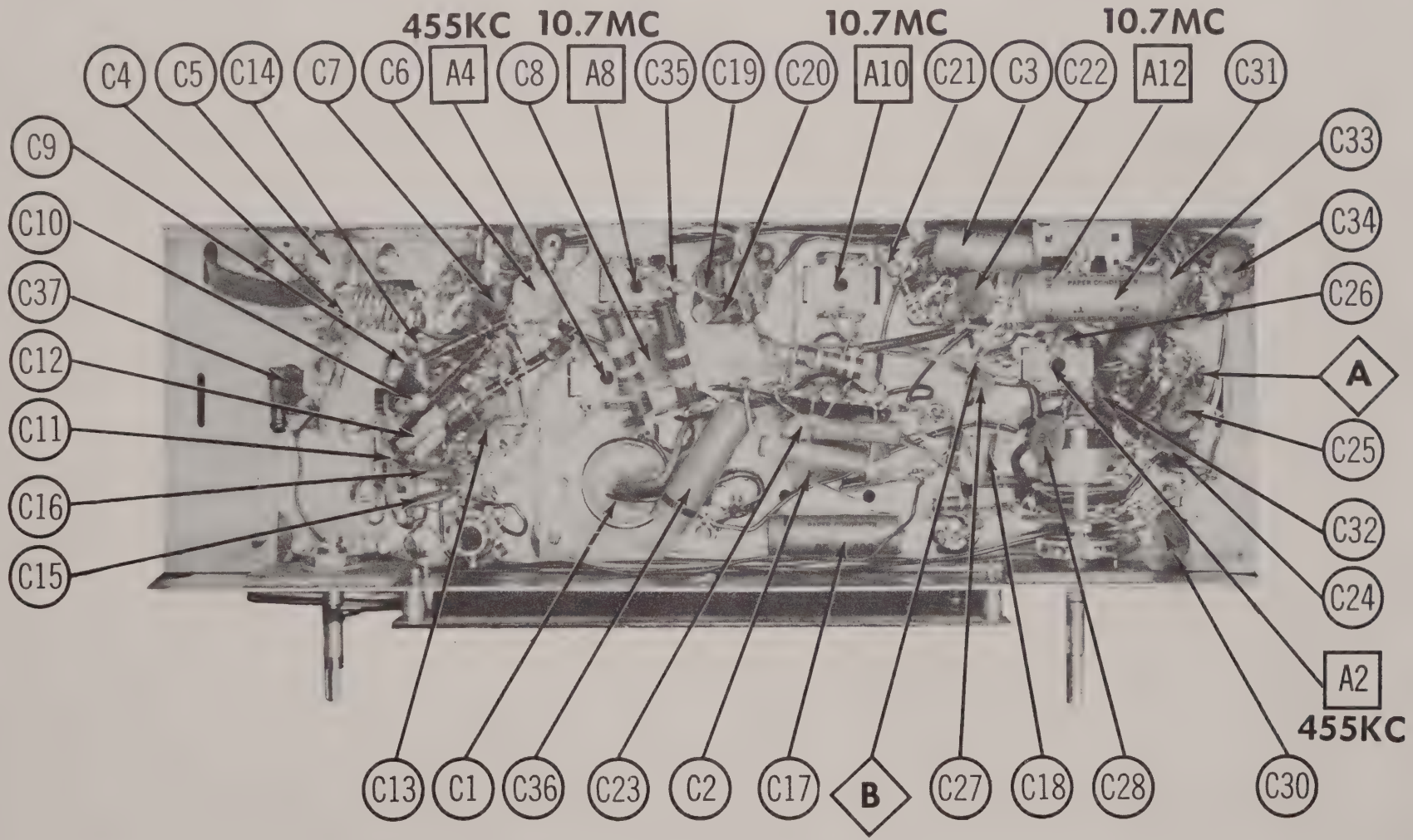
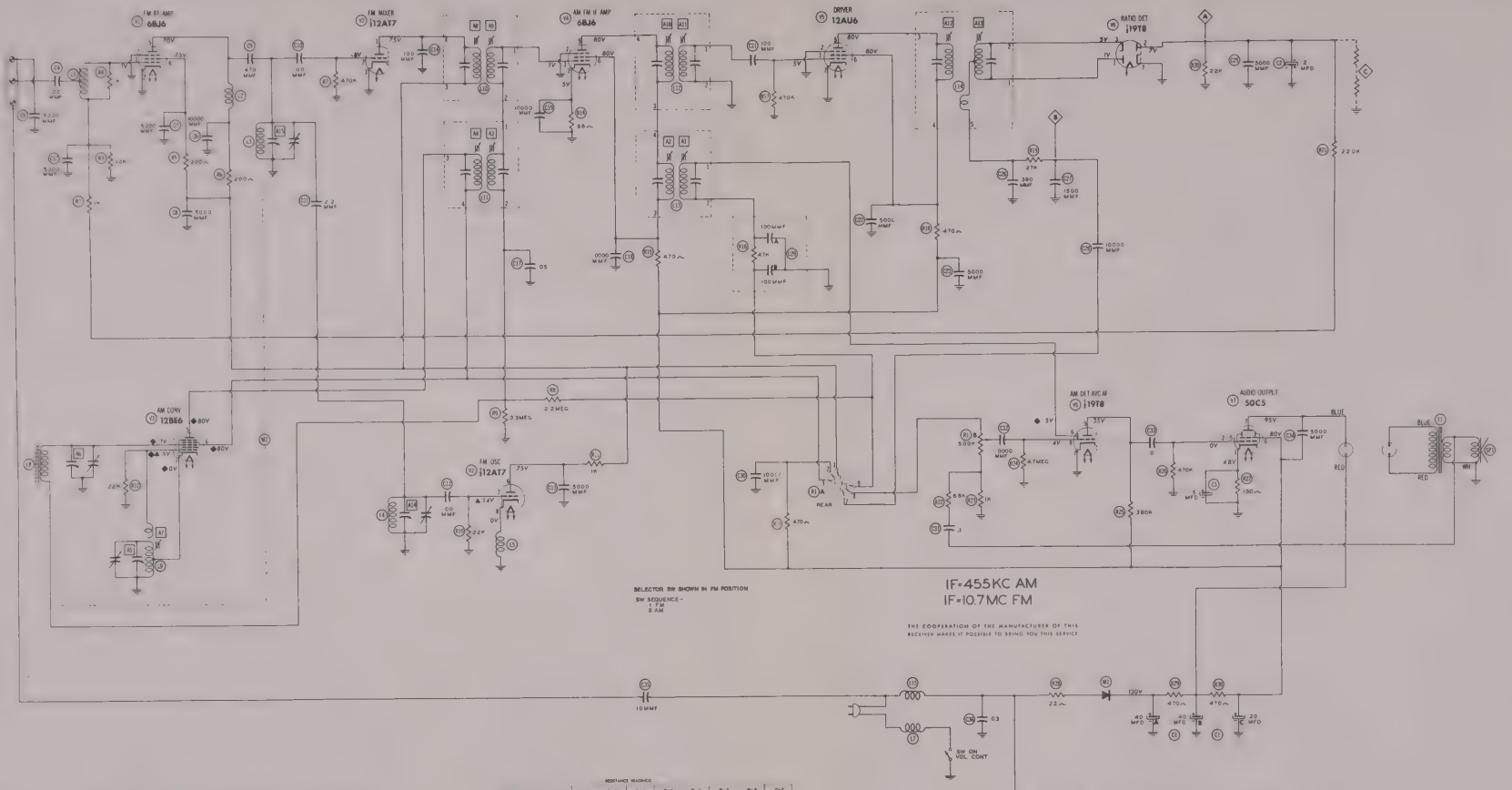


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
*	6BJ6	470Ω	0Ω	680Ω	820Ω	1.05Ω	11.8KΩ	2K		
*	12A17	11.4KΩ	470Ω	52Ω	36Ω	120Ω	12.4KΩ	325K	2Ω	0Ω
*	12BE6	425KΩ	0.2Ω	260Ω	120Ω	401.4KΩ	41.4KΩ	41.5MΩ	9.5MΩ	
*	12AU6	1.5MΩ	88Ω	620Ω	56Ω	11.4KΩ	1Ω	68Ω	2Ω	
*	12A17	470Ω	2Ω	58Ω	66Ω	11.4KΩ	11.4KΩ	2Ω		
*	12T8	1MΩ	218Ω	12KΩ	58Ω	240	440KΩ	2Ω	6.1MΩ	130KΩ
*	50C5	160Ω	1 470Ω	250	880	470Ω	1840	1 1840		

ALL MEASUREMENTS IN THE POSITION UNLESS OTHERWISE SPECIFIED.
* MEASURED IN AM POSITION
† MEASURED FROM OUTPUT OF MI
* TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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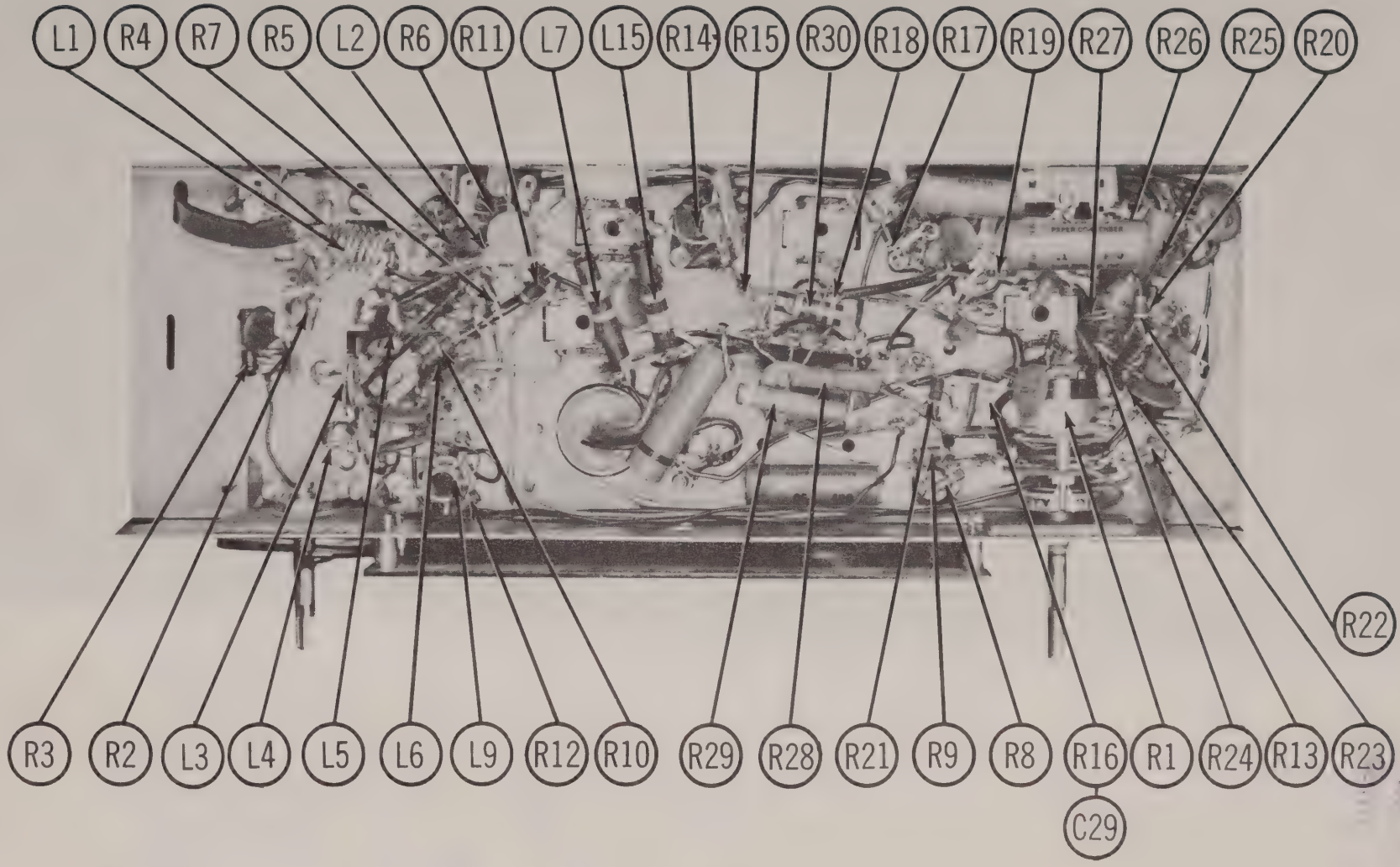


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ROLAND
MODEL 8FTIM

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn tuning gang fully closed and set pointer to last reference mark at low frequency end of dial back plate.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V3). Low side to chassis.	455KC (400~Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1650KC	"	"	"	A5	"
3.		Loop	1400KC	"	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	"	Tune to 600KC signal	"	A7	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistor is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.1MFD	High side to pin 2 (grid) of 12AT7 (V2A) Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120Ω sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
5.	.1MFD	High side to pin 2 (grid) of 12AT7 (V2A) Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. to point Ⓐ. Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizer capacitor C2. Adjust for curve of maximum amplitude and symmetry as in Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A13	Reconnect capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistors	High side to FM antenna terminal (disconnect link). Low side to chassis.	108.5MC (Unmod)	FM	Tuning gang fully open.	DC probe to point Ⓐ Common to chassis.	A14	Adjust for maximum deflection.
8.	"	"	105MC	"	Tune to 105MC signal.	"	A15	"
	The following adjustments should be made only if necessary for proper tracking or to cover the FM range.							
9.	270Ω Carbon Resistors	High side to FM antenna terminal. Low side to chassis.	87.5MC	FM	Tuning gang fully closed.	DC probe to point Ⓐ Common to chassis.	L4	Compress or expand L4 for maximum deflection.
10.	"	"	108.5MC	"	Tuning gang fully open.	"	A14	Adjust for maximum deflection.
11.	"	"	90MC	"	Tune to 90MC signal.	"	L3	Compress or expand L3 for maximum deflection while rocking tuning gang.
12.	Repeat step 8.							

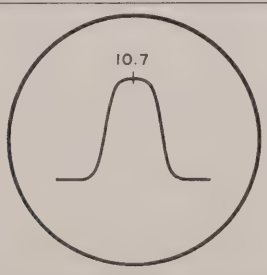


FIG. 1

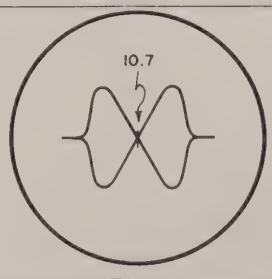


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ROLAND PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier	6BJ6	6BJ6	7CM	
V2	FM Converter	12AT7	12AT7	9A	
V3	AM Converter	12BE6	12BE6	7CH	
V4	FM-AM IF Amp.	6BJ6	6BJ6	7CM	
V5	Driver	12AU6	12AU6	7BK	
V6	FM Detector-AM Det.-AVC-AF Amp.	19T8	19T8	9E	
V7	Audio Output	50C5	50C5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

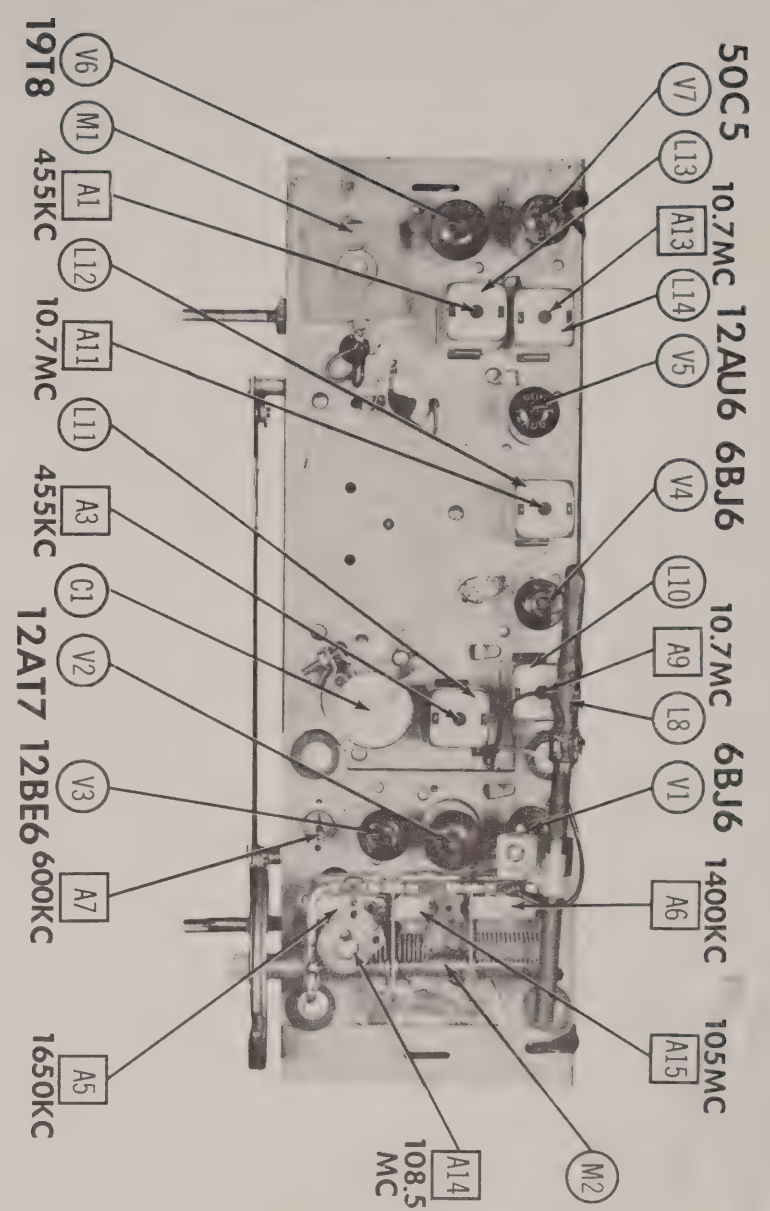
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/50-30-20		EDL44215		3N532		Red
B	40	150								Blue
C	20	150								Green
C2	2	50		PRS150/4		BBR-2-50T		TC302	TVA-1301	
C3	5	50		PRS150/4		BR550		TC30	TVA-1303	
C4	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C5	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C6	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C7	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C8	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C9	470			BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C10	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C11	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C12	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C13	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C14	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C15	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C16	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C17	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C18	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C19	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C20	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C21	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C22	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C23	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C26	390			SI390	D6-391		GP2K-391		5GA-T39	
C27	1500			BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C28	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C29A	100			SI100	♦PC-50	TM5T1	♦1403-01	GP1K-101	♦100C1	
B	100			SI100		TM5T1		GP1K-101		
C30	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C31	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C32	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C33	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C34	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C35	10			SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C36	.03	600								
C37	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	

♦ Items C29A, C29B, R16 are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	Switch		VC-40					AM-FM Switch
B	500KΩ	1/2						Volume & Switch

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ROLAND PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	1000Ω	1/2		BTS-1000	
R3	10KΩ	1/2		BTS-10K	
R4	1000Ω	1/2		BTS-1000	
R5	200Ω	1/2			
R6	200Ω	1/2			
R7	470KΩ	1/2		BTS-470K	
R8	2.2Meg	1/2		BTS-2.2Meg	
R9	3.3Meg	1/2		BTS-3.3Meg	
R10	22KΩ	1/2		BTS-22K	
R11	1000Ω	1/2		BTS-1000	
R12	22KΩ	1/2		BTS-22K	
R13	470Ω	1/2		BTS-470	
R14	68Ω	1/2		BTS-68	
R15	470Ω	1/2		BTS-470	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ROLAND PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R16	47KΩ	1/2	♦	BTS-47K	
R17	470KΩ	1/2		BTS-470K	
R18	470Ω	1/2		BTS-470	
R19	27KΩ	1/2		BTS-27K	
R20	22KΩ	1/2		BTS-22K	
R21	220KΩ	1/2		BTS-220K	
R22	6800Ω	1/2		BTS-6800	
R23	1000Ω	1/2		BTS-1000	
R24	4.7Meg	1/2		BTS-4.7Meg	
R25	390KΩ	1/2		BTS-390K	
R26	470KΩ	1/2		BTS-470K	
R27	150Ω	1		BTA-150	
R28	22Ω	3			
R29	470Ω	2		BTB-470	
R30	470Ω	1		BTA-470	

♦ Items R16, C29A, C29B are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ROLAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.3KΩ	3.5Ω	176Ω	.56Ω		A-3876 ①	A-2928 ①	RO-2 ①	S-2X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ROLAND PART No.	REPLACEMENT DATA VIKING PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4 x 6"	PM	3.5Ω		46J6	46A07	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ROLAND PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω						Tapped
L2	FM RF Choke	.5Ω					4612	11.2 Microhenries
L3	FM RF Coil	0Ω						
L4	FM Osc.Coil	0Ω						
L5	Cathode Choke	.5Ω					4612	11.2 Microhenries
L6	Fil. Choke	.5Ω					4612	11.2 Microhenries
L7	Fil. Choke	6.5Ω					4610	5.5 Microhenries, (IRC part #CL-1)
L8	AM Ant.Coil	.75Ω						
L9	AM Osc.Coil	6.5Ω						Tapped ② .5Ω
L10	1st. FM IF	.5Ω	.65Ω	IFT-51	16-3487	FM-254	1463	
L11	1st. FM IF	8.5Ω	8.5Ω	IFT-55	16-6758	BC-352	12-C1	
L12	2nd. FM IF	.7Ω	.7Ω	LF-52	16-3487	FM-254	1463	
L13	2nd. FM IF	9Ω	8.5Ω	LF-55	16-6758	BC-353	12-C2	
L14	Ratio Det.	1.6Ω	.9ΩCT	LF-53		FM-255	1465	Tertiary winding-.4Ω
L15	Fil. Choke	6.5Ω					4610	5.5 Microhenries, (IRC apart #CL-1)

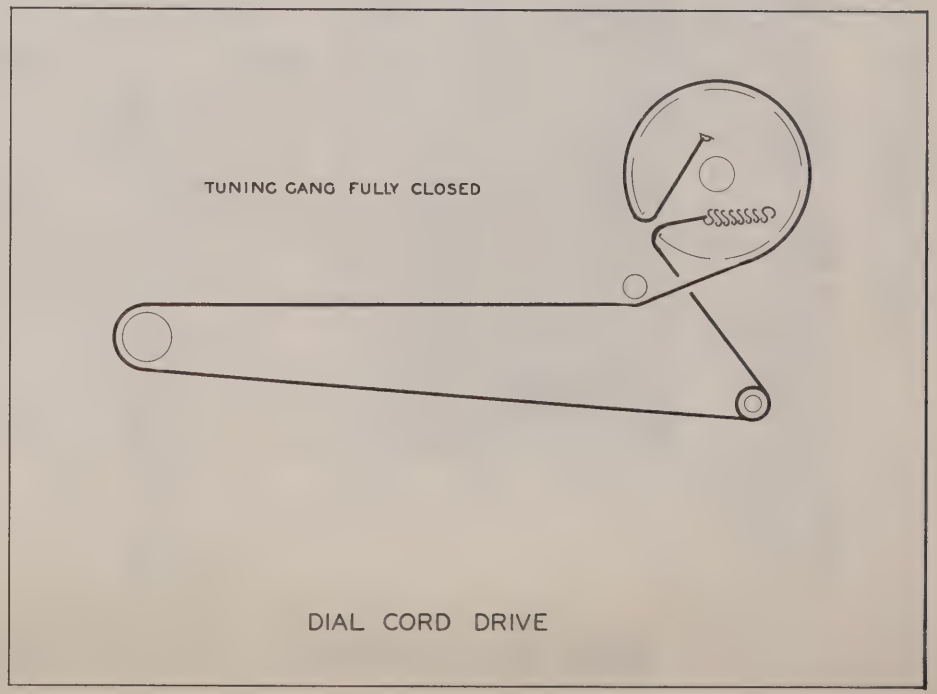
PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA ROLAND PART No.	REPLACEMENT DATA SYLVANIA PART No.	REPLACEMENT DATA SELETRON PART No.	REPLACEMENT DATA FEDERAL PART No.	REPLACEMENT DATA MALLORY PART No.	REPLACEMENT DATA SARKES TARZIAN PART No.
M1	.067ADC		NC5	5M1	1004A	6S100	100

MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M2	Tuning Capacitor	CV-24	37-496MMF, 15-145MMF



PHOTOFACT* Folder

ZENITH MODELS K-1812E-3, K-1812R-3 (Ch. 19K22-3), K-2229E-3, K-2229R-3 (Ch. 19K24-3)

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MODEL K-1812E-3

ZENITH MODELS K-1812E-3, K-1812R-3 (Ch. 19K22-3), K-2229E-3, K-2229R-3 (Ch. 19K24-3)

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ZENITH MODELS
K-1812E-3, K-1812R-3 (Ch. 19K22-3), K-2229E-3, K-2229R-3 (Ch. 19K24-3)

DENVER, COLORADO

ZENITH MODELS
K-1812E-3, K-1812R-3 (Ch. 19K22-3),
K-2229E-3, K-2229R-3 (Ch. 19K24-3)

ZENITH MODEL K-1812E-3

TRADE NAME	Zenith Models K-1812E-3, K-1812R-3 (Ch. 19K22-3), K-2229E-3, K-2229R-3 (Ch. 19K24-3)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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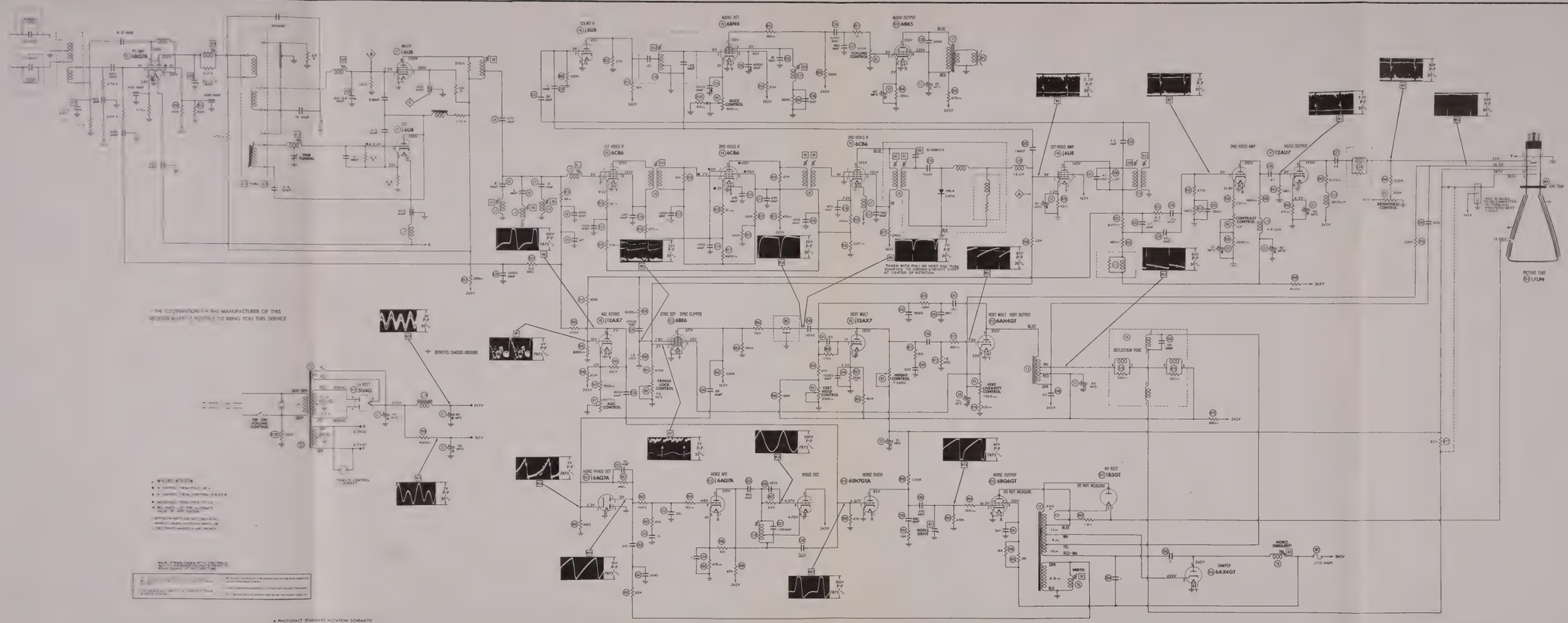
R-F UNIT
6BQ7A
MIXER
6AU8
OSC
6AU8
TUNING
SOUND IF
6AU8
AUDIO DET
6BN6
VOLUME CONTROL
AUDIO OUTPUT
6BK5
BLUE
1ST VIDEO IF
6CB6
2ND VIDEO IF
6CB6
3RD VIDEO IF
6CB6
GIMMICK
1N64
CRYSTAL
1ST VIDEO AMP
6AU8
2ND VIDEO AMP
VIDEO OUTPUT
12AU7
CONTRAST CONTROL
BRIGHTNESS CONTROL
PICTURE TUBE
17LM4
ION TRAP
TAKEN WITH POLL OR VERT. SYNC TUBE SHORTED. TO LOWER & HEIGHT CORE AT CENTER OF ROTATION
AGC KEYING
12AX7
SYNC SEP. SYNC CLIPPER
6BE6
HORIZ. HOLD CONTROL
AGC CONTROL
VERT. MULT.
12AX7
VERT. MULT. VERT. OUTPUT
6AH4GT
BLUE
HEIGHT CONTROL
VERT. LINEARITY CONTROL
VERT. HOLD CONTROL
DEFLECTION YOKE
HORIZ PHASE DET
6AQ7A
HORIZ AFC
6AQ7A
HORIZ OSC
HORIZ DRIVER
6SN7GTA
HORIZ OUTPUT
6BQ6GT
DO NOT MEASURE
DY RECT
1B3GT
WIDTH
HORIZ LINEARITY
DAMPER
6AX4GT
HORIZ OSCILLATOR
.175 AMP.
365V
245V
165V
AC SW
VOLUME CONTROL
RECT
5U4G
TONE CONTROL
DENOTES CHASSIS GROUND
THE EQUIPMENTATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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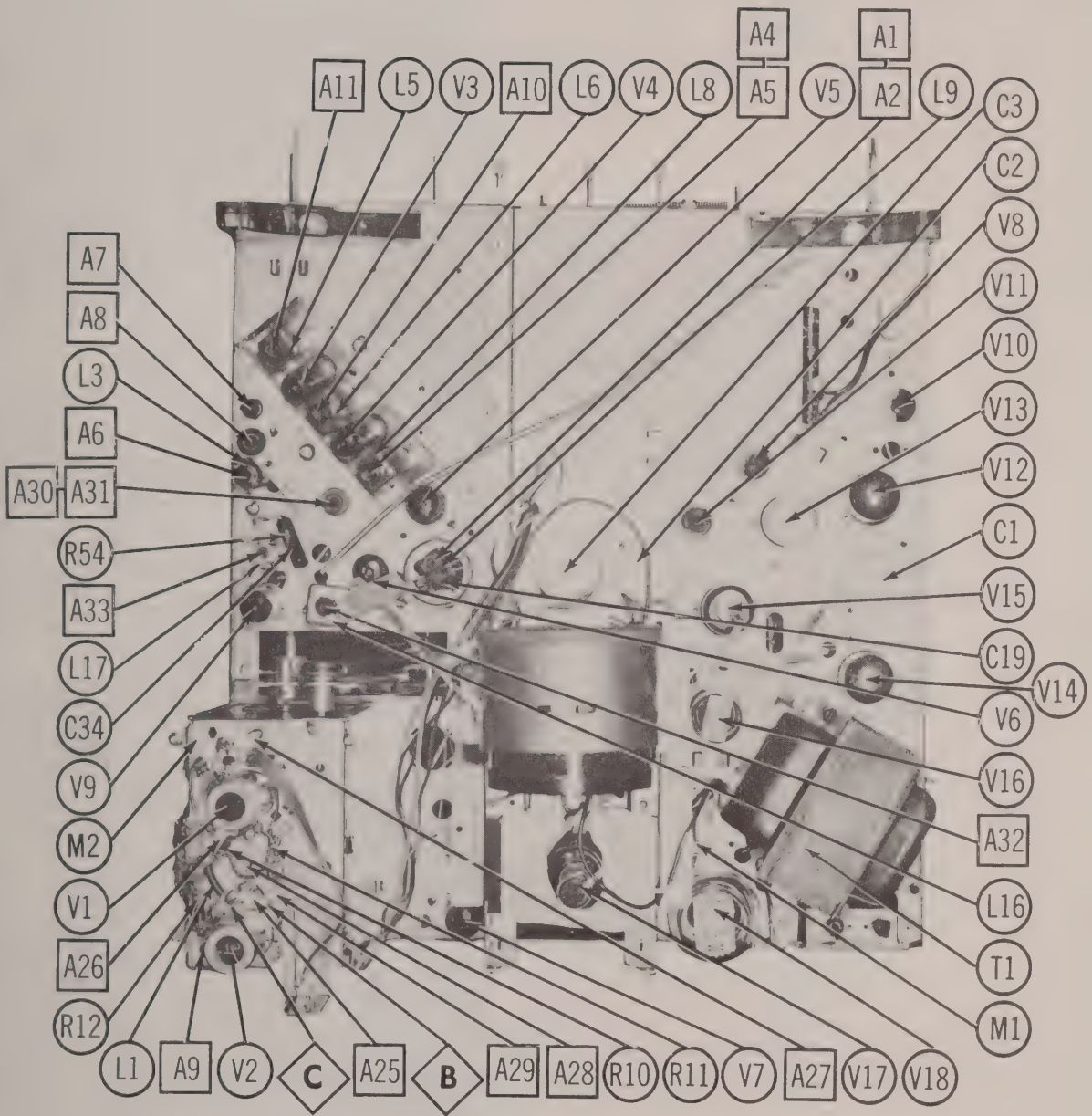
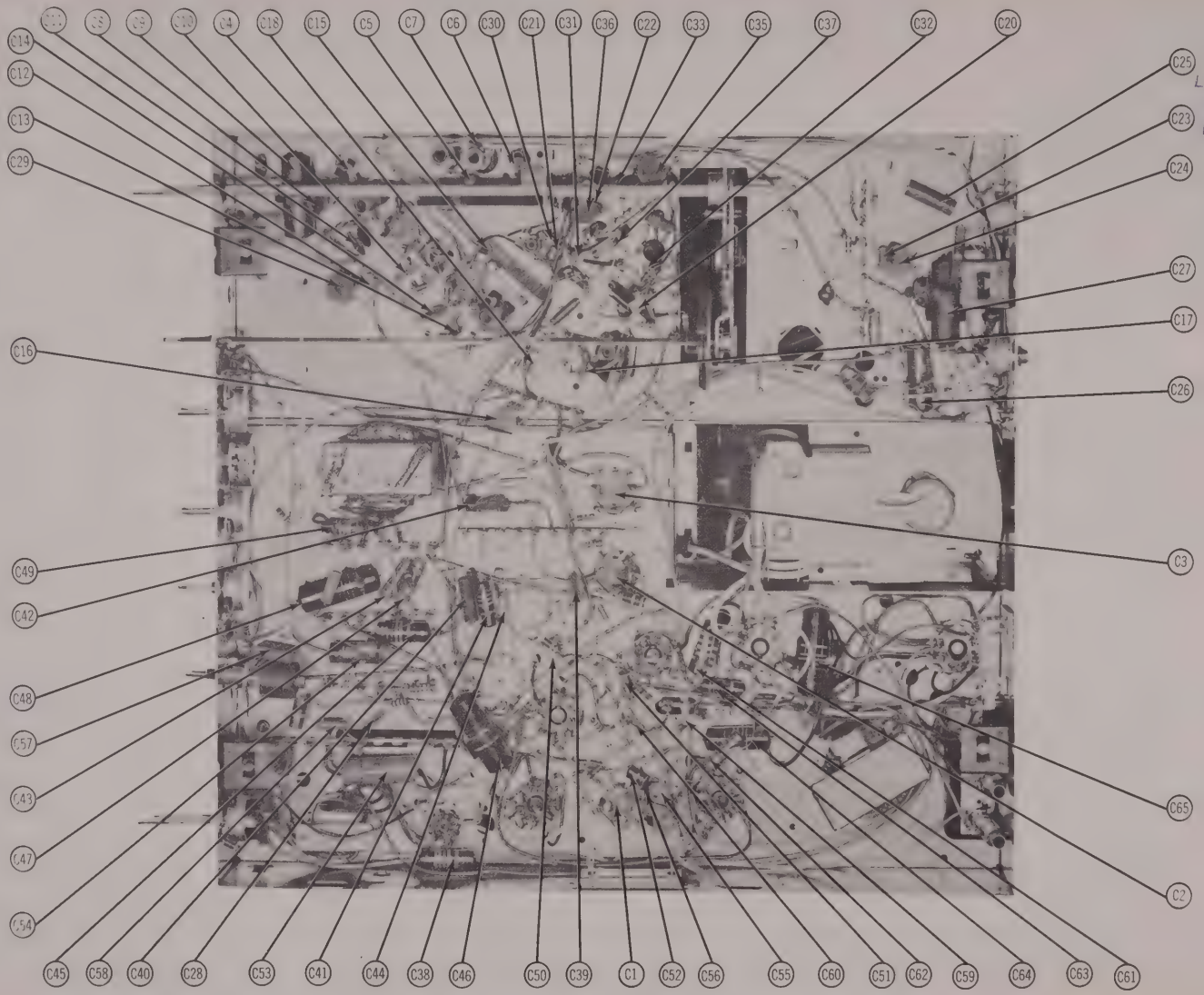
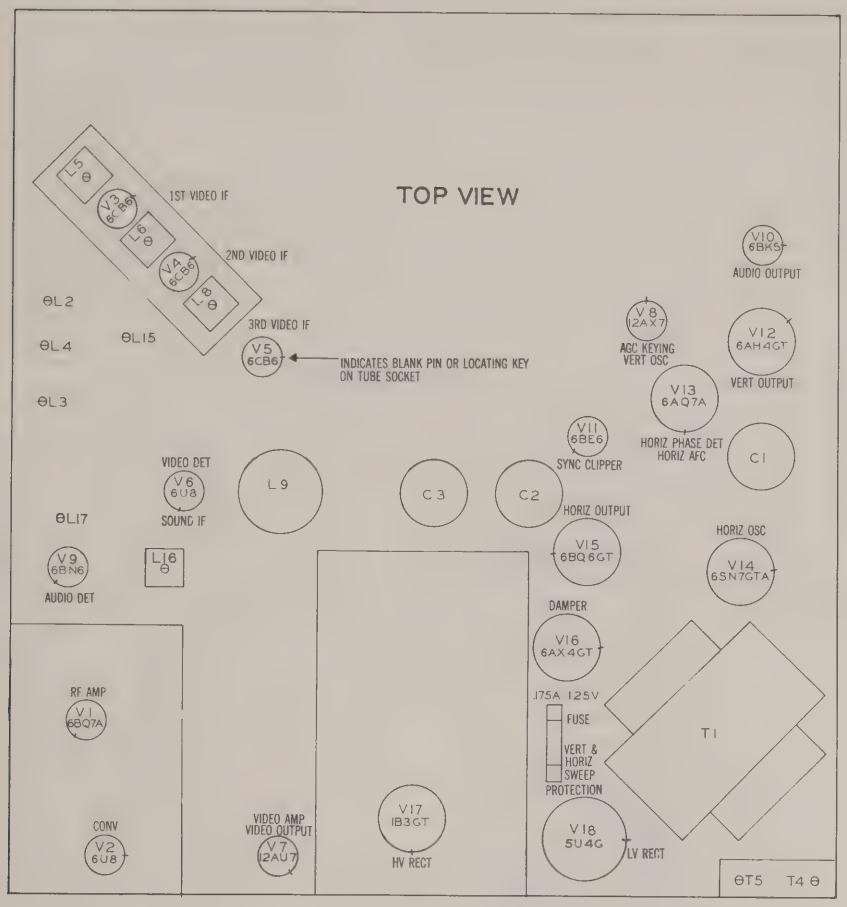


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound -V18

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster -V2, V3, V4, V5
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V19
Has pic, no sound - V6, V9, V10
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V8, V11, V12
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V19, Fuse (M1)
No vertical deflection - V8, V12
Poor vert. linearity or foldover - V8, V12
Poor horiz. linearity or foldover -V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18
Vert. off freq. - V8, V11, V12
Horiz. off freq. - V11, V13, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 2 volt bias source to the ungrounded side of C9. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	44MC (10MC Swp)	44MC	Any non interfering channel.	Vert. amp thru 10KΩ to point (A) Low side to chassis.	A1, A2, A3	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. A3 is an adjustable coupling "gimmick" which may be rotated with the fingers. Attenuate generator for two volts peak to peak response on scope.
2.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	"	"	"	"	A4, A5	Preset the bottom slug half way out of coil and the top slug all the way out of coil. Adjust for response similar to Fig. 2.
3.	"	High side to point (B) (on top of tuner). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A6, A7, A8	Remove the bias battery and set scope gain to amplify the trap region of the response curve. Adjust for MINIMUM marker amplitude.
4.	"	"	"	42.75MC 45MC 45.75MC	"	"	A9, A10, A11	Replace the bias battery. Adjust for response curve similar to Fig. 3. If necessary retouch A1 thru A5 for desired response.

OSCILLATOR ALIGNMENT

The master oscillator adjustment of A12 is to be made only if adjustment of the individual channel oscillator screws fails to bring the channels well within the range of the fine tuning control.
If channels 2 thru 6 fall within the range of the fine tuning control, but the higher channels do not, slight adjustment of A12 may bring the higher channels in.
Connect the negative lead of a 1 volt bias source to the ungrounded side of C9. Connect the positive lead to chassis.
Turn the oscilloscope gain up so that the trap notch becomes visible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp)	59.75MC	2	Vert amp to point (A) Low side to chassis.	A13	Adjust to place sound marker in notch as in Fig. 4.
			63MC (10MC Swp)	65.75MC	3		A14	
			69MC (10MC Swp)	71.75MC	4		A15	
			79MC (10MC Swp)	81.75MC	5		A16	
			85MC (10MC Swp)	87.75MC	6		A17	
			177MC (10MC Swp)	179.75MC	7		A18	
			183MC (10MC Swp)	185.75MC	8		A19	
			189MC (10MC Swp)	191.75MC	9		A20	
			195MC (10MC Swp)	197.75MC	10		A21	
			201MC (10MC Swp)	203.75MC	11		A22	
			207MC (10MC Swp)	209.75MC	12		A23	
			213MC (10MC Swp)	215.75MC	13		A24	

RF AND MIXER ALIGNMENT

Leave bias source connected as under Oscillator Alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	61.25MC 65.75MC	3	Vert amp thru 10KΩ to point (C) Low side to chassis.	A25, A26, A27	Adjust for response curve similar to Fig. 5.
7.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A28, A29	Adjust for symmetrical response curve similar to Fig. 6.

FIG. 1

FIG. 2

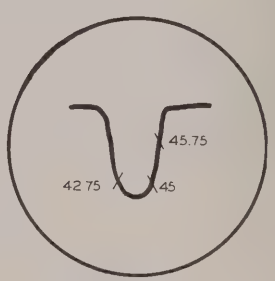


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

SOUND IF ALIGNMENT

Connect an attenuator (Zenith part #S-17203 or equivalent) in series with the receiver antenna.
Tune in a tone modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 limiter-detector, as evidenced by a hiss similar to superregeneration.
Adjust the sound take-off transformer, A30 and A31, the sound IF coil A32, and the quadrature coil A33, for maximum sound of best quality.
Adjust the buzz control (R9A) for minimum intercarrier buzz.
If the intercarrier buzz cannot be eliminated with the buzz control, check the setting of the AGC delay adjustment.
If during the sound IF alignment the signal rises above the limiting level (hiss disappears) increase the attenuation until the hiss returns.

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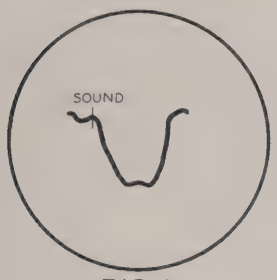
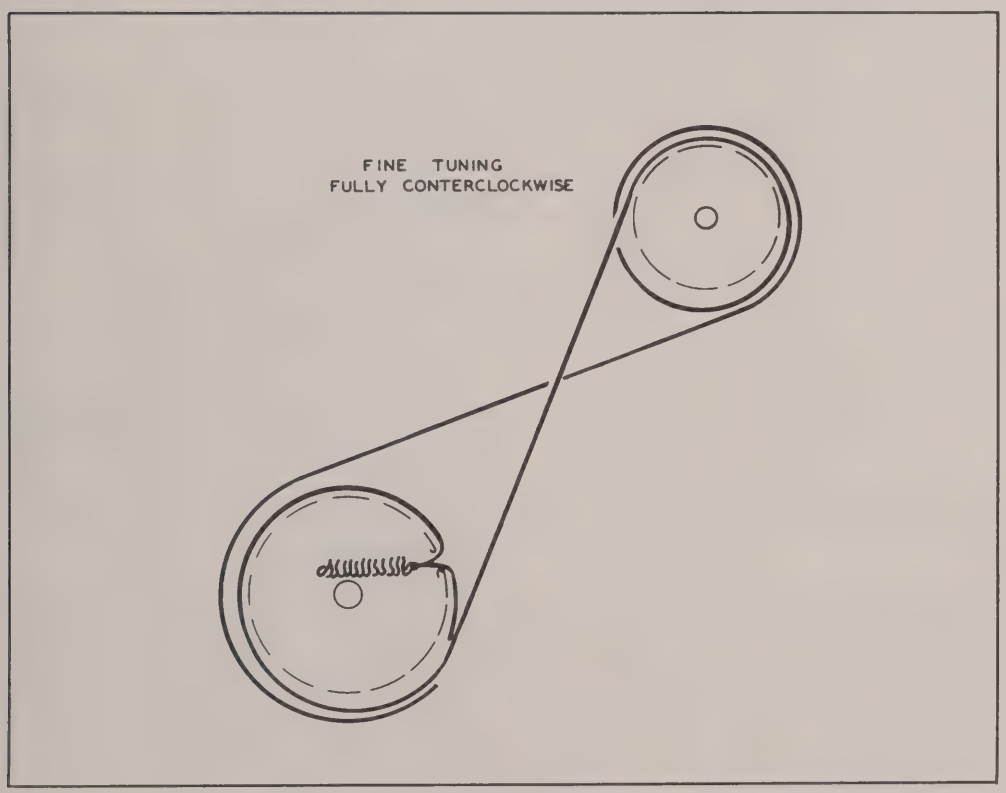


FIG. 4

FIG. 5

FIG. 6

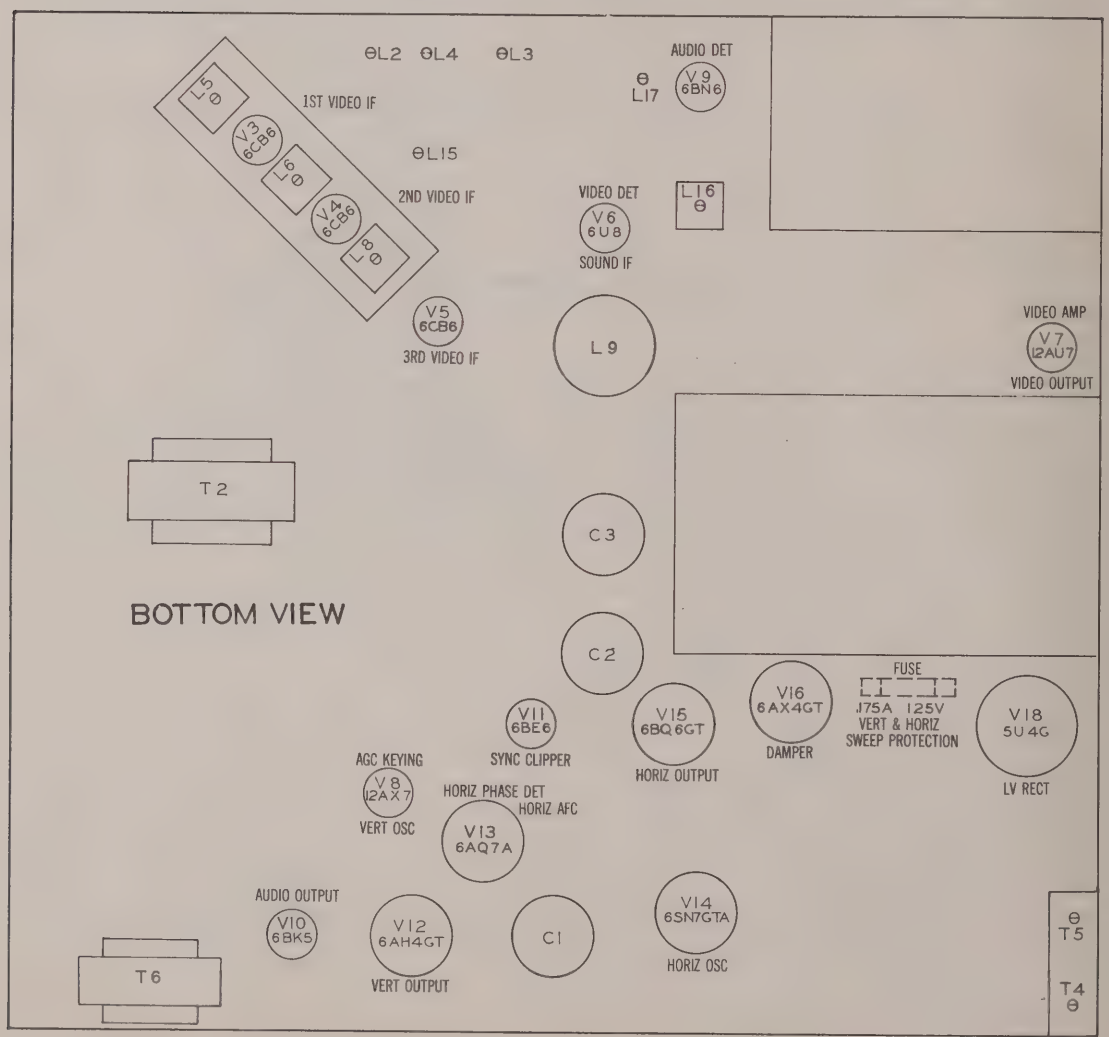


FINE TUNING DRIVE CORD STRINGING

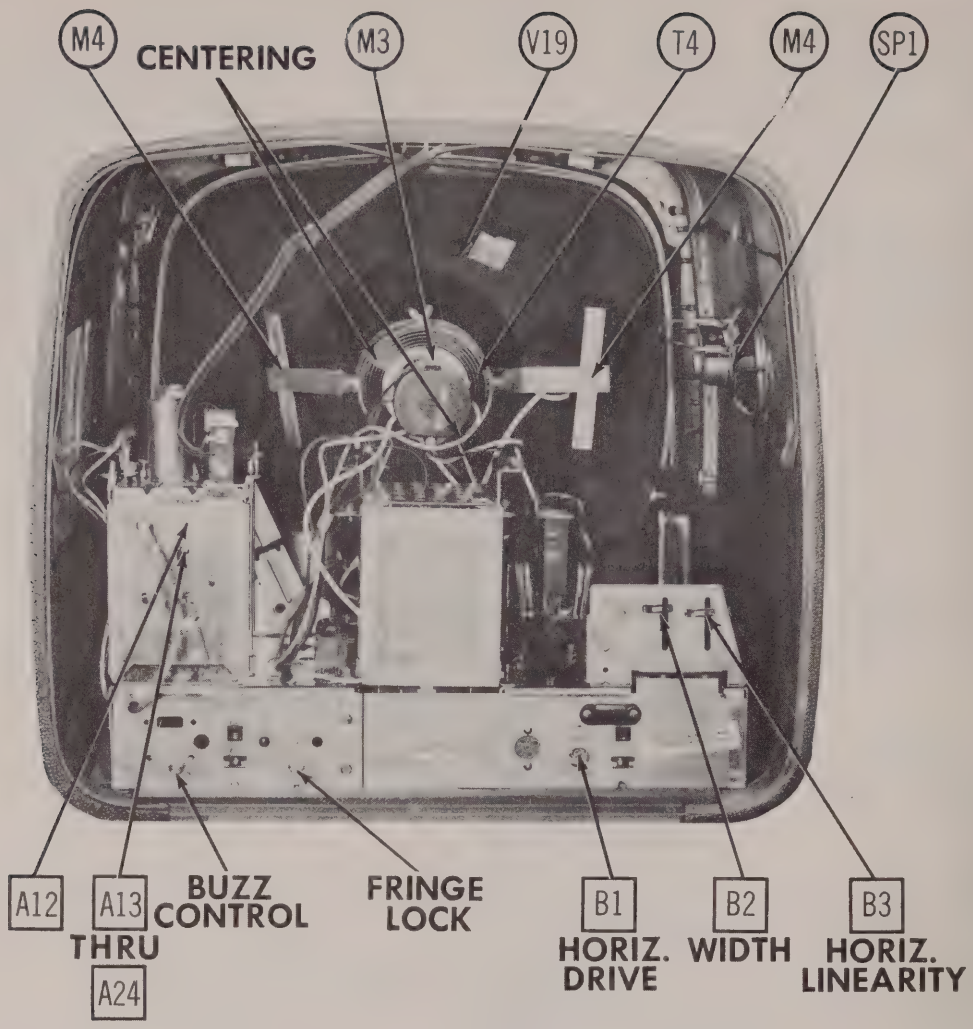
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	†900Ω	†55KΩ	INF	.1Ω	0Ω	INF	3.6Meg	47Ω	0Ω
V 2	6U8	†270KΩ	100KΩ	†100KΩ	.1Ω	0Ω	†430Ω	0Ω	2.2KΩ	4.4KΩ
V 3	6CB6	1.2Meg	606Ω	.1Ω	0Ω	■ 480Ω	■480Ω	0Ω		
V 4	6CB6	■6.8KΩ	70KΩ	.1Ω	0Ω	†570Ω	†570Ω	■15Ω		
V 5	6CB6	220Ω	320Ω	.1Ω	0Ω	†6.7KΩ	†6.7KΩ	0Ω		
V 6	6U8	†26KΩ	3.9KΩ	†4KΩ	0Ω	.1Ω	†8.8KΩ	82Ω	0Ω	220KΩ
V 7	12AU7	†5.8KΩ	1.5Meg	4.1KΩ	0Ω	0Ω	†8.3KΩ	1 Meg	470Ω	.1Ω
V 8	12AX7	▲3.6Meg	500KΩ	2.7KΩ	0Ω	0Ω	685KΩ	8.2KΩ	4.8KΩ	.1Ω
V 9	6BN6	190Ω	.2Ω	.1Ω	0Ω	†2.6KΩ	220KΩ	†330KΩ		
V 10	6BK5	†1.1KΩ	INF	5Ω	.1Ω	0Ω	150Ω	5Ω	†570Ω	.1Ω
V 11	6BE6	22KΩ	0Ω	.1Ω	0Ω	†90KΩ	1KΩ	1.5Meg		
V 12	6AH4GT	1.8Meg	.1Ω	1.8Meg	INF	†12KΩ	INF	0Ω	1KΩ	
V 13	6AQ7A	2 Meg	1 Meg	0Ω	3 Meg	†47KΩ	470Ω	.1Ω	0Ω	
V 14	6SN7GTA	47KΩ	▲180KΩ	0Ω	33KΩ	†97Ω	10.5KΩ	.1Ω	0Ω	
V 15	6BQ6GT	†97Ω	.1Ω	15KΩ	†9.1KΩ	470KΩ	470KΩ	0Ω	0Ω	Top Cap ▲1MΩ
V 16	6AX4GT	8Ω	INF	INF	†97Ω	†108Ω	▲4Ω	.1Ω	0Ω	
V 17	1B3GT	PINS 1 8 HAVE INF RESISTANCE								Top Cap ▲451Ω
V 18	5U4G	INF	16KΩ	†97Ω	22Ω	INF	20Ω	INF	16KΩ	
V 19	17LP4	0Ω	220KΩ	Pin 6 ▲33KΩ	Pin 10 ▲33KΩ	Pin 11 240KΩ	Pin 12 .1Ω			

† MEASURED FROM PIN2 OF V18.
■ MEASURED FROM PIN 2 OF V4.
▲ MEASURED FROM PIN 3 OF V16.



TUBE PLACEMENT CHART



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B1) for greatest picture width.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

AGC DELAY CONTROL ADJUSTMENT

Connect the vertical amplifier of an oscilloscope through 10KΩ to point ◇A. Select the strongest TV signal available and adjust the delay control for 2 volts peak response on scope.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 5 wood screws. Remove rear cover.
3. Disconnect built-in antenna and speaker.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 2 speaker nuts. Remove speaker. (Not necessary for chassis removal).

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: ZENITH PART No.	STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	Converter	6U8	6U8	9AK	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector-Sound IF Amp.	6U8	6U8	9AE	
V7	Video Amplifier-Video Output	12AU7	12AU7	9A	
V8	AGC Keying-Vert. Oscillator	12AX7	12AX7	9A	
V9	Audio Detector	6BN6	6BN6	7DF	
V10	Audio Output	6BK5	6BK5	9BQ	
V11	Sync Clipper	6BE6	6BE6	7CH	
V12	Vert. Output	6AH4GT	6AH4GT	8EL	
V13	Horiz. Phase Det, Horiz. AFC	6AQ7A	6AQ7A		
V14	Horiz. Oscillator	6BN7GTA	6BN7GTA	8BD	
V15A	Horiz. Output	6HJ8GT	6HJ8GT	6AM	
B	Horiz. Output	6HJ8G	6HJ8G	6AM	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V19A	17LP4	17LP4	I2C	① Circuit change necessary.
B	21FP4A	21FP4A	I2C	
		21FP4 ①	I2C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±40	400	22-2358	PAFH3-134		C037			TVL-4870	
B	±20	400		PRS450/80		SR502A				
C	±30	400								
D	40	25								
C2A	±20	350	22-2443	PAFH2-80		BO46			R1376	
B	±20	25		PRS150/40-		EDL8415				
C	±20	400								
D	±40	25								
C3A	±40	400	22-2368	PAFH3-188			FP396.2		TVL-4804	
B	10	25		PRS450/40						
C	±0	475					TC3501			
D	±100	50								
C4	470		22-2217	SI470	D6-471	TM5T1	GP2K-471	UC-5347	5GA-T47	
C5	6		22-2051				NP0K-060			
C6	5		22-2050	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C7	8		22-2051				NP0K-060			
C8	1000		22-?	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C9	.47	200	22-2146	P288-47		PJ2P5		PT405	3TM-P47	
C10	330		22-2309	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C11	1000		22-?	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C12	1000		22-?	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C13	470		22-2302	SI470	D6-471	TM5T1	GP2K-471	UC-5347	5GA-T47	
C14	1000		22-?	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C15	470		22-6	BPD-00047	DD-471	TM5T1	GP2K-471	UC-5347	5GA-T47	
C16	1000		22-?	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C17	560		22-2310	SI560	D6-561		GP2K-561	UC-5356	5GA-T56	
C18	470		22-6	BPD-00047	DD-471	TM5T1	GP2K-471	UC-5347	5GA-T47	
C19	7		22-1874	SI6.8NP0	TCZ-6.8		NP0K-070	ZT-5568	5TCCB-V68	
C20	4		22-1763	SI4NP0	TCZ-4		NP0K-040		5TCCB-V4	
C21	47		22-2466	SI47N080			N080-338-470			
C22	27		22-2459		TCZ-27		NP0I-270			
C23	470		22-2217	SI470	D6-471	TM5T1	GP2K-471	UC-5347	5GA-T47	
C24	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C25	.0082	200	22-2431							
C26	.047	600	22-1844	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C27	.22	400	22-1825	P488-22		PTE4P23		PT4025	4TM-P22	
C28	2000		22-8	BPD-002	D6-202	TM5D2	801-002	DC-522	5HK-D2	
C29	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C30	3.3		22-2343	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C31	50		22-2480	SI50NP0	TCZ-50		NP0-333-500	ZT-545	5TCC-Q5	
C32	5		22-2050	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C33	10		22-1895				N030-331-100			
C34	.047	200	22-1778	P288-047	DF-503	PJ2S5		PT4147	3TM-S47	
C35A	10000		22-2276	BPD-2X01	DD-3-103	TM5D81	811-01	DC-511	5HK-S81	
B	10000						811-01	DC-511		
C36	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C37	680		22-2320	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C38	.0068	600	22-2228	P688-0068	D6-682	PTE6D68	GP2-333-683		6TM-D68	
C39	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C40	.0022	600	22-1845	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C41	.025	200	22-1850	P288-015		PTE6S15		TP400	6TM-S15	
C42	.0022	600	22-1814	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C43	.001	600	22-2128	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C44	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C45	.022	600	22-2129	P688-022		PTE6S22		PT6122	6TM-S22	
C46	.1	600	22-1841	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C47	.001	600	22-2128	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C48	.22	200	22-2167	P488-22		PTE4P22		PT4025	2TM-P22	
C49	.0033	600	22-2248	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233		
C50	56	500	22-1831							

PARTS LIST AND DESCRIPTIONS

CAPACITORS (CONT.)

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51	75	500	22-1258	1469-000075						
C52	.001	500	22-2127	P688-001	D6-102	PTE6D1	GP2L-102	MCE230		
C53	47	200	22-2106	P288-15		PTE4P15		PT417	2TM-P15	
C54	15	200	22-1777	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C55	680	400	22-2125	1469-0007		SR5T7			M5-37	
C56	.0015	400	22-1785	P688-0015	D6-152	PTE6D15	GP2L-152		6TM-D15	
C57	1100	500	22-2410							
C58	1000		22-2112							
C59	680		22-2387	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C60	220		22-2458	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C61	.047	400	22-1775	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C62	.0047	200	22-1842	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C63	.001	600	22-2127	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C64	.1	400	22-2340	P488-1		PTE4P1		PT401	4TM-P1	
C65	.15	400	22-2341	P488-15		PTE4P15		TP417	4TM-P15	
C66	56	2000							20GA-Q56	

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	63-2777	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KBS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	7.5 Meg with 1Meg setup	½	63-2394	Q11-142		A8-89	U-82	Height-See note
B	Shaft		Not Req.	Not Req.		AK-1	Not Req.	Attach to R2A
R3A	200KΩ	½	63-2837	Q11-129	AG-52-S	AB-46	U-43	Brightness
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R3A
R4A	2500Ω	½	63-2834	Q11-112	AG-15-S	AB-7	U-8	Vert. Hold
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R4A
R5A	1500Ω	½	63-2815	Q11-110	AG-11-S	AB-6	BU-6	Vert. Linearity
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	10KΩ	½	63-2833	Q17-116	AG-30-V	AB-17	U-19	Contrast
B	Shaft		Not Req.	Not Req.	KBS-3	AK-4	Not Req.	Attach to R6A
R7	4000	½	63-3183					AGC
R8A	7.5Meg	½	63-2805	Q11-142		AB-89	U-82	Fringe Lock
B	Shaft		Not Req.	Not Req.		AK-1	Not Req.	Attach to R8A
R9A	600Ω	1	63-3182	Q11-105	AG-5-S	AB-4	U-4	Buzz
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R9A

Note: Connect a 1Meg resistor in series with right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R10	100KΩ	½	63-1809	BTS-100K	
R11	100KΩ	½	63-1809	BTS-100K	
R12	330Ω	1	63-2286	BTA-330	
R13	2.2Meg	½	63-1926	BTS-2.2Meg	
R14	68Ω	½	63-1737	BTS-68	
R15	56Ω	½	63-1733	BTS-56	
R16	470Ω	½	63-1772	BTS-470	
R17	6800Ω	½	63-1820	BTS-6800	
R18	15KΩ	½	63-1834		
R19	150	½	63-1708	BTS-15	
R20	330Ω	½	63-1764	BTS-330	
R21	470Ω	½	63-1772	BTS-470	
R22	120KΩ	½	63-1873	BTS-120K	
R23	120KΩ	½	63-1873	BTS-120K	
R24	27KΩ	½	63-1843		
R25	100Ω	½	63-1743	BTS-100	
R26	220Ω	½	63-1757	BTS-220	
R27	2700Ω	½	63-1787	BTA-2700	
R28	22KΩ	½	63-1841	BTS-22K	
R29	82Ω	½	63-1740	BTS-82	
R30	22KΩ	½	63-1841	BTS-22K	
R31	62000Ω	5% 2	63-1579	BTS-6200 5%	
R32	680Ω	5% ½	63-1777	BTS-680 5%	
R33	4.3Meg	5% 1	63-1837	BTS-4.3Meg 5%	
R34	82000Ω	5% ½	63-1823	BTS-8200 5%	
R35	100KΩ	½	63-1809	BTS-100K	
R36	470KΩ	5% ½	63-1896	BTS-470K 5%	
R37	1Meg	½	63-1911	BTS-1Meg	
R38	220Ω	½	63-1757	BTS-220	
R39	2200Ω	½	63-1799	BTS-2200	
R40	3900Ω	½	63-1810	BTS-3900	
R41	1Meg	½	63-1911	BTS-1Meg	
R42	470Ω	½	63-1771	BTS-470	
R43	8200Ω	½	63-1101	BTB-8200	
R44	220KΩ	½	63-1884	BTS-220K	
R45	470KΩ	½	63-1898	BTS-470K	
R46	8200Ω	½	63-1824	BTS-8200	
R47	3900Ω	½	63-1810	BTS-3900	
R48	100KΩ	2	63-19 82	BTB-100K	
R49	680KΩ	½	63-1904	BTS-680K	
R50	220KΩ	½	63-1884	BTS-220K	
R51	56KΩ	½	63-1859	BTS-56K	
R52	27KΩ	½	63-1845	BTS-27K	
R53	22KΩ	½	63-1055	BTA-22K	
R54	220KΩ	½	63-1883	BTS-330K	
R55	680Ω	½	63-1778	BTS-680	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R56	330KΩ	½	63-1890	BTS-330K	
R57	1000Ω	½	63-1786	BTS-1000	
R58	150Ω	½	63-1750	BTS-150	
R59	470Ω	1	63-2398	BTA-470	
R60	1.5Meg	½	63-1918	BTS-1.5Meg	
R61	470KΩ	½	63-1898	BTS-470K	
R62	330KΩ	½	63-1890	BTS-330K	
R63	100KΩ	½	63-1869	BTS-100K	
R64	33KΩ	½	63-1848	BTS-33K	
R65	180KΩ	5% ½		BTS-180K 5%	
R66	150KΩ	5% ½		BTS-150K 5%	
R67	2700Ω	5% ½		BTS-2700 5%	
R68	470KΩ	½	63-1897	BTS-470K	
R69	47KΩ	½	63-1855	BTS-47K	
R70	100KΩ	½	63-1869	BTS-100K	
R71	15KΩ	½	63-1834	BTS-15K	
R72	1.8Meg	½	63-1922	BTS-1.8Meg	
R73	100Ω	½	63-1744		
R74	820Ω	5% ½		BTS-820 5%	
R75	680Ω	1	63-2304	BTA-680	
R76	22000Ω	2	63-1883	BTS-2200K	
R77	33KΩ	½	63-1848	BTS-33K	
R78	560Ω	½	63-1775	BTS-560	
R79	560Ω	½	63-1775	BTS-560	
R80	1Meg	½	63-1911	BTS-1Meg	
R81	1Meg	½	63-1911	BTS-1Meg	
R82	1Meg	½	63-1911	BTS-1Meg	
R83	47KΩ	½	63-1855	BTS-47K	
R84	100Ω	½	63-1744		
R85	470Ω	½	63-1771	BTS-470	
R86	10KΩ	2	63-1198	BTB-10K	
R87	22KΩ	½	63-1841	BTS-22K	
R88	47KΩ	½	63-1194	BTA-47K	
R89	47KΩ	½	63-1856	BTS-47K	
R90	150KΩ	½	63-2130	BTA-150K	
R91	15KΩ	½	63-1834	BTS-15K	
R92	22KΩ	1	63-958	BTA-22K	
R93	470KΩ	½	63-1898	BTS-470K	
R94	100Ω	2	63-1744		
R95	18KΩ	2	63-2364	BTB-18K	
R96	18KΩ	2	63-2364	BTB-18K	
R97	1.5Ω	½	63-2129		
R98	1800Ω	1	63-1959	BTA-1800	
R99	4000Ω	10	63-2794	1 3/4A-4000	
R100	100KΩ	½	63-1870	BTS-100K	
R101	82Ω	½		BTS-82	Note

Note: Not used in all Models.

TRANSFORMER (POWER)

ITEM No	RATING: PRI	SEC 1	SEC 2	SEC 3	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA TYPE No.
T1	117VAC 1.8A	760VCT 270ADC	5VAC ② 3A	12.6VCT 4.4A	95-1298			TP-173		

TRANSFORMER (SWEEP CIRCUITS)

ITEM No	RATING: DC RESISTANCE PRI	SEC	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	465Ω@ 2.95A 102. 11. 25	2.95Ω SEC. 2 0Ω	95-1928						Horiz. Output Trans.
T3	396Ω@ 3.2A 2.2Ω 3.9Ω		95-1309	A-8113 ①		T90-13			Vert. Output Trans.
T4	18Ω		95-1335 ③	DY-9A ③	MDF-72 ④	TY-3 ③ ⑥	Y-17 ⑤	21LD2 ③	Horiz. Deflection Coils
T5	12Ω		95-1337 ③						
T6	8Ω		95-8570	WC-2 ⑤ ⑧	MWC-2	TL-3 ⑤	WC-11 ⑩	20LR3 ⑤ ⑨	Horiz. Linearity Coil
T6	8Ω		95-9486	WC-5 ⑦	MWC-5	TWL-1	WC-12 ⑤ ⑧	21ZR1	Width Coil

① Connect blue lead to plate and red lead to point of original B+. Tie green lead of transformer to white lead of yoke and connect to chassis ground. Tie yellow lead of trans to red lead of yoke and connect to vertical blanking circuit.
② Alternate deflection yoke.
③ Use original yoke cover.
④ Use original deflection coil network.
⑤ Drill new mounting hole.
⑥ Do not use tap.
⑦ Do not use secondary.
⑧ Connect to coded blue and red terminals.
⑨ Includes positioning device.
⑩ Connect to coded orange and green terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No	NOTES
T7	6K	3.2Ω	540Ω	.7Ω	95-1340 95-1339 ②	A-3877	A-2930	RO-9 ①	S-3X	① Drill one new mounting hole. ② Alternate audio output

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	JENSEN PART No.	QUAM PART No	NOTES
SP1 A	4"	PM	3.2Ω	49-719	ST-113 (Mod. P4-X)	4A07	① Used on Models K-2229E-3, or K-2229R-3
B	5 1/4"	PM	3.2Ω	46-696 ①	ST-503 (Mod. P-525)	52A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Fil. Choke	0Ω		20-391				
L2	41.25MC Trap	0Ω		S-18209				Less core, core part #149-LU
L3	39.75MC Trap	0Ω		S-18744				Less core, core part #149-LU
L4	47.25MC Trap	0Ω		S-18210				Less core, core part #149-LU
L5	1st. Video IF	.1Ω		S-19736				Less core, core part #149-LU
L6	2nd. Video IF	0Ω	0Ω	S-17907				Less core, core part #149-LU
L7	Fil. Choke	0Ω		S-18984			4612	9.6 Microhenries
L8	3rd. Video IF	.1Ω	.1Ω	S-18730				Less core, core part #149-LU
L9	4th. Video IF	.3Ω	.3Ω	S-18590				Includes C19, 1N64 Crystal detector part #103-1, series peaking coil part #S-17911, shunt peaking coil wound on resistor part #S-18751
L10	Series Peaking Coil	1.5Ω		S-18128			4612	12 Microhenries
L11	Shunt Peaking Coil	4.4Ω		S-19360				Wound on resistor
L12	Shunt Peaking Coil	13.5Ω		S-17858	19-3500	TV-188	6174	481 Microhenries
L13	Shunt Peaking Coil	25Ω		S-18749			4664	1.6 Microhenries
L14	Series Peaking Coil	6.5Ω		S-18750				Wound on resistor
L15	1st. Sound IF	1.8Ω	3.8Ω	S-18568				Less core, core part #149-BS
L16	2nd. Sound IF	.2Ω	tap@0Ω	S-19712				Includes .01MMF Cap. less coil shield and lug, coil shield slug part # S-19714 and less core, core part #149-96
L17	Quadrature Coil	4.8Ω		S-19001	20-1005			Less core, core part #149-LU
L18	Horiz. Osc.	150Ω		S-19743	19-1577			Tapped @ 50Ω, less core, core part #149-131

K-1812R-3 (Ch. 19K22-3), K-2229E-3, K-2229R-3 (Ch. 19K24-3)

ZENITH MODELS K-1812E-3,

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Check T2 and T4A. Check for loose solder joints in yoke and on horizontal output transformer.

INSUFFICIENT SWEEP

Check by substitution V14, V15, V16 and V18. Check amplitude of waveform W18.

If Unsatisfactory	If Satisfactory
Check all components of horizontal discharge tube, especially R90 and coupling capacitor C60.	Check all components of horizontal output and damper circuits. Check especially T2, T4A and T6. Check also C61.

RASTER SHRINKS HORIZONTALLY

Check by substitution R90. It may increase in resistance when heated.

DRIVE LINES

Substitute V15 and V16. Check drive control and R90.

COMPRESSED AT LEFT SIDE

Substitute V15 and V16. Check T5 and associated components.

FOLDS

Substitute V16. Check T4A and associated components.

VERTICAL

LOSS OF SWEEP

Substitute V8 and V12. Check waveform W11.

If Unsatisfactory	If Satisfactory
Check components in plate circuit of V8B. Check C46 for open.	Check components of vertical output tube, especially T3, T4A, R72 and R73.

STRETCHED AT TOP COMPRESSED AND FOLDED UP AT BOTTOM (Fig. 1)

Check waveshaping network C45 and R71 for open .

INSUFFICIENT SWEEP

Substitute V8 and V12. Follow procedure outlined under LOSS OF SWEEP. Check B+.

COMPRESSED AT BOTTOM

Substitute V12. Check C3D. Check other associated components.

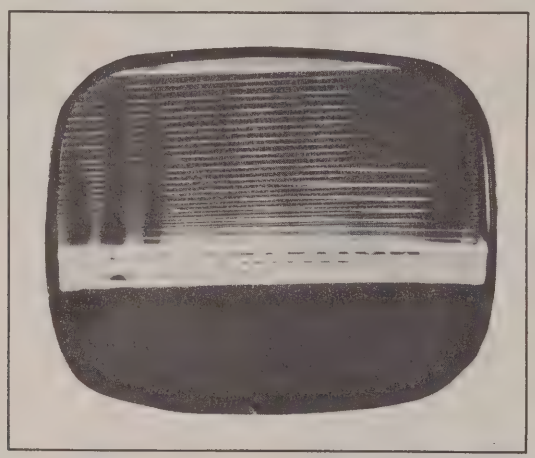


Fig. 1. STRETCHED AT TOP, COMPRESSED AND FOLDED UP AT BOTTOM
See VERTICAL SWEEP

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V13 and V14. Check waveform W16.

If Unsatisfactory	If Satisfactory
Check all components of horizontal phase detector and control tube. Check components of horizontal oscillator grid and cathode circuits.	Check all components of horizontal discharge tube. Check coupling capacitor C58 for leakage.

CRITICAL HOLD

Substitute V13 and V14. Follow procedure outlfined under LOSS OF SYNC.

PULLING PICTURE

Substitute V13 and V14. Follow procedure outlined under LOSS OF SYNC. Check V14 and V15 for heater to cathode leakage.

VERTICAL

LOSS OF SYNC

Check by substitution V11, V8 and V12. Check waveform W9.

If Unsatisfactory	If Satisfactory
Check all components of sync clipper and coupling capacitor C39 and R34.	Check all components of vertical oscillator, especially C41 and C47.

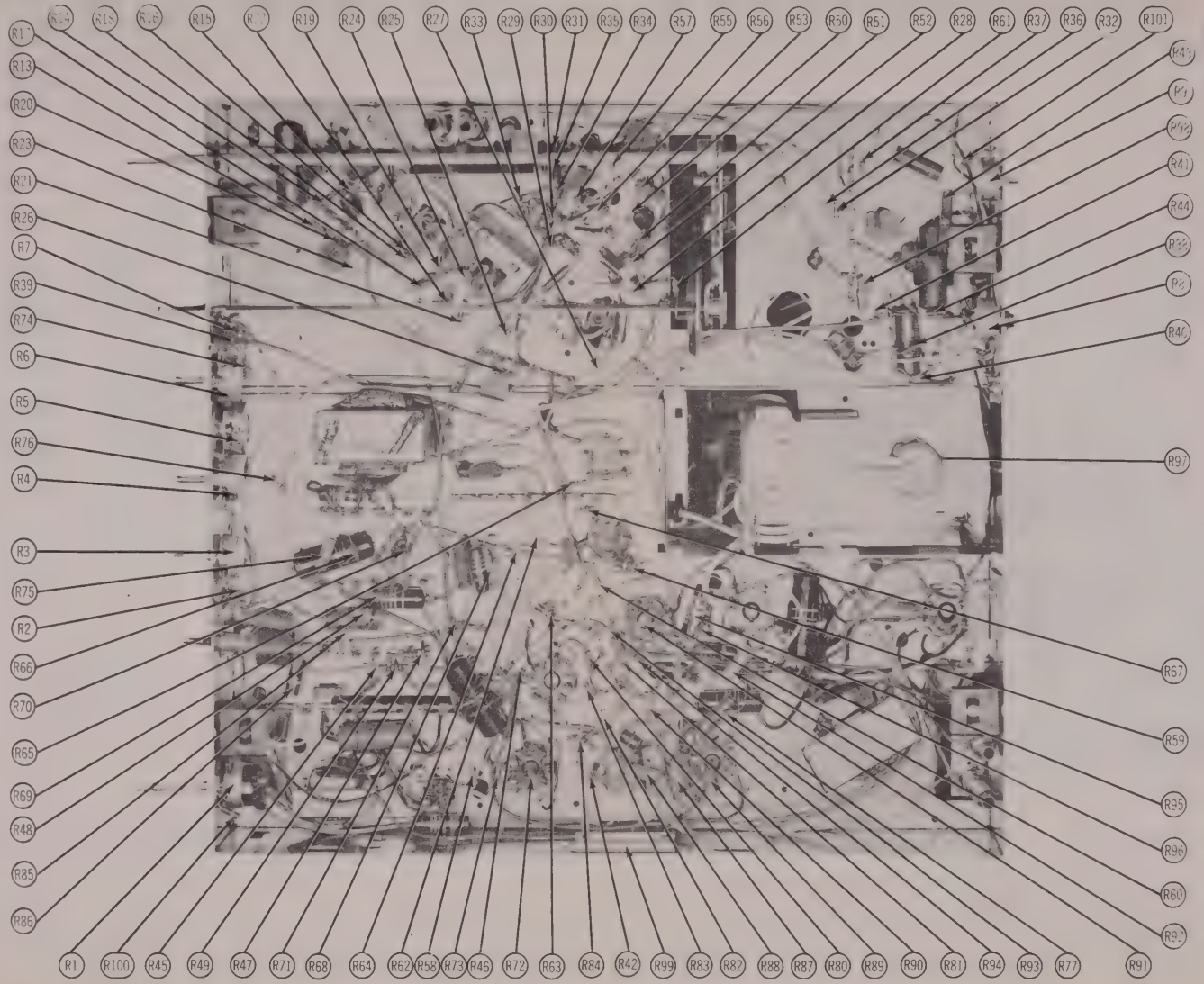
CRITICAL SYNC

Substitute V8, V11 and V12. Follow procedure outlined under LOSS OF SYNC.

TRIGGERING

Substitute V11 and V12. Follow procedure outlined under LOSS OF SYNC

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L19	.240ADC	97Ω	3 Hy.	95-1280	C-2326 ①		C-15X ①	

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	.175A Ⓐ 125V	136-21	83-1883	313.175 (3AG/.175A Slo/Blo)	357001	MDL 175/1000	4405

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2A	RF Tuner	S-19840	
B	RF Tuner	S-18770	Used in early production
M3	Ion Trap	S-17164	
M4	Correction Magnet	S-18763	2 Used
M5	Integrator	87-1	
B1	Trimmer Cap.	22-2457	Horiz. Drive
	Cabinet	14-1431E	Model K-1812E-3
	Cabinet	14-1431R	Model K-1812R-3
	Cabinet	14-1552E	Model K-2229E-3
	Cabinet	14-1552R	Model K-2229R-3
	Back Cover	S-18917	Models K-1812E-3, K-1812R-3
	Back Cover	S-18919	Models K-2229E-3, K-2229R-3
	Control Cover	S-19762	Models K-1812E-3 (Includes emblem)
	Control Cover	S-19738	Model K-1812R-3 (Includes emblem)
	Escutcheon Assy.	S-19752	Model K-2229E-3 (Includes control cover and emblem)
	Escutcheon Assy.	S-19751	Model K-2229R-3 (Includes control cover and emblem)
	Safety Glass	192-151	Models K-1812E-3, K-1812R-3
	Safety Glass	192-158	Models K-2229E-3, K-2229R-3
	Disc	27-184	Channel Indicator
	Scale	26-502	Channel Indicator
	Knob	46-1122	Channel Selector
	Knob	46-1051	Fine Tuning, Models K-1812E-3, K-1812R-3
	Knob	46-1052	Fine Tuning, Models K-2229E-3, K-2229R-3
	Knob	46-1127	Off/On Volume, Models K-1812E-3, K-2229E-3
	Knob	46-1126	Off/On Volume, Models K-1812R-3, K-2229R-3
	Knob	46-1116	Brightness, Contrast, Vert. Hold (3 Used)
	Knob	46-1117	Horiz. Hold, Models K-1812E-3, K-1812R-3
	Knob	46-1118	Horiz. Hold, Models K-2229E-3, K-229R-3

TROUBLE SHOOTING AIDS (CONT.)

VIDEO

LOSS OF VIDEO

Substitute V7 and check associated components. Check picture tube.

SOUND BARS

Check adjustment of A30 and A31. Check setting of local oscillator and alignment of video IF stages.

POOR RESOLUTION

Check alignment of tuner and video IF stages. Substitute V6 and V7. Check associated components.

ONE BLACK BAR ACROSS PICTURE

Check tuner, video IF and video amplifier tubes for heater to cathode leakage.

POOR CONTRAST

Check by substitution V5, V6 and V7. Check associated components. Check picture tube.

AUDIO

WEAK OR NO SOUND

Check by substitution V6, V9 and V10. Check associated components including speaker and T7.

BUZZ

Substitute V9. Adjust buzz control. If buzz is still present, align sound following sound alignment procedure. If buzz is still noticeable, check AGC delay control and substitute V6.

DISTORTED

Check audio stage using audio signal generator.

If Undistorted	If Distorted
Check adjustment of take-off trap and components of intercarrier sound amplifier.	Check components of sound output stage.

POWER

SET DEAD

Substitute V18. Check interlock. Check B+ filter network.

SMALL RASTER, WEAK SOUND

Follow procedure outlined under SET DEAD.

DIM PICTURE

Follow procedure outlined under LOSS OF HIGH VOLTAGE and SET DEAD. Check picture tube for low emission.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Substitute V14, V15, V16 and V17. Check fuse located just forward of 5U4. Check waveform W18.

If Unsatisfactory	If Satisfactory
Check all components of horizontal oscillator. Check coupling and wave-shaping network between V14 and V15.	Check components of horizontal output, damper and high voltage rectifier circuits, especially T2, T4A, T6 and R97.

INSUFFICIENT HIGH VOLTAGE

Substitute V14, V15, V16 and V17. Follow procedure outlined under LOSS OF HIGH VOLTAGE. Substitute V18 and check B+ circuit.

BLOOMING

Follow procedure outlined under INSUFFICIENT HIGH VOLTAGE.

GENERAL

HAS RASTER BUT NO SOUND OR PICTURE

Check by substitution V2, V3, V4 and V5. Check associated components.

SNOWY PICTURE

Substitute V1. Check tuner and video IF alignment.

INTERMITTENT STREAKS

Check high voltage circuit for corona arcing and discharge.

COMPLETE LOSS OF SYNC

Substitute V11 and check associated components.

The Trouble - Shooting photographs shown are made with permission of transmitting station WFBM-TV and in on way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator circuit, it is necessary to remove the rear cover. Adjustments are made through the hole marked " Bull's Eye Adjustment", and are accessible one at a time as the selector switch is turned to that channel (Fine tuning control must be set in the center of its range before making adjustments.)

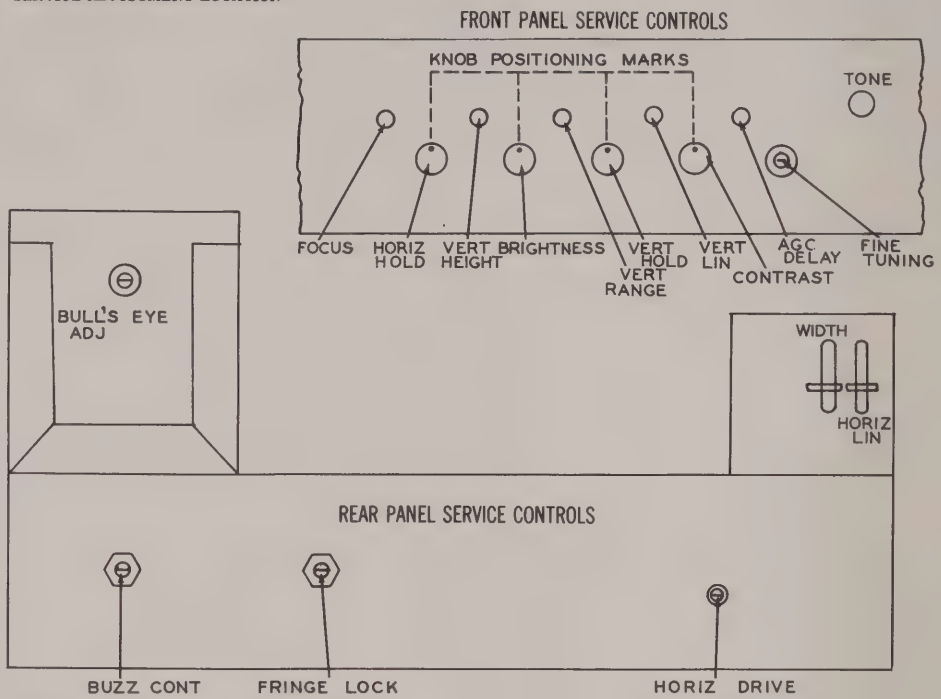
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS

AGC Delay Adjustment on Front of Chassis

(See Horiz. Sweep circuit adj. on page 10.)

Fringe Lock Adjustment on Rear Apron of Chassis

Turn the fringe lock control to 1/4 turn from full clockwise position. Adjust the vertical and horizontal hold for picture synchronization and check stability by switching off channel and back again. Slightly retouch the fringe lock control adjustment, if necessary, for maximum stability while testing as above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from front panel service controls. Adjust the horizontal hold until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on rear apron of chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

FUSES

One fuse is used for horizontal sweep circuit protection. (See tube placement chart, for location).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION

Adjust the vertical and horizontal size controls so that the corners and sides of the picture are visible. Bend the corrector magnet arms to obtain a raster having right angle corners and straight, parallel sides. Restore the picture to normal size.

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